LIBRARY OF CONGRESS
193.132
JUN 18 1889
SMITHSONIAN BEQUEST

THE AMERICAN

GAS LIGHT JOURNAL

REDMAN & KENNY, N.Y.

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, VENTILATION, WATER SUPPLY AND DISTRIBUTION, & GENERAL SCIENCE.

VOLUME L.—No. 24.
Whole No. 732.

NEW YORK, MONDAY, JUNE 17, 1889.

$3 PER ANNUM,
IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager.
JOS. R. THOMAS, C.E., Editor. T. J. CUNNINGHAM, Asst. Editor.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y. AS SECOND CLASS MATTER.

Published on each Monday of the year, at No. 42 Pine Street, N. Y.

Terms of Subscription, Including Postage.—For the United States and Canada, $3 per annum. European countries, $4.00 (17 shillings—20 francs). All payments to be made in advance. Single copies, 10 cents.

Remittances should be made either by post-office order, registered letter, or bank draft on New York, payable to the order of A. M. Callender & Co.

Correspondence.—Wishing to make this JOURNAL a gazette of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, correspondence is solicited for publication from all who make the study of those subjects a pleasure or a profession.

The American News Company, Nos. 39 and 41 Chambers street, New York, are agents for this JOURNAL. Newsdealers will send orders to them.

Books.—We will forward by express, at publisher's lowest rates, any book—scientific or otherwise—to any address in the United States or Canada. No books will be sent C. O. D.

Collections are invariably made directly from this office, for subscriptions, advertisements, etc. We have agents to solicit the same, but they are not authorized to receipt for money.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

EDITORIALS—

Briefly Told..... 789

One More for Egner—The Tail Wagged the Dog—Annual Meeting, Newark, N. J.—Lima (O.) must Pay the Gas Company.

Twelfth Annual Meeting, Western Gas Association—Official Report—Concluded from page 761..... 790

Points on the Management of Small Coal Gas Works, as Deduced from 25 Years' Experience, by L. P. Gerould—Discussion—Question-Box: "Are the results obtained in using long scoops to charge retorts in small gas works adequate to pay the increased cost of labor required?"—"Are self-sealing lids a success?"—"Should any coal gas maker use Lima oil as an enricher; if so, where?"—"Is a steam-jet exhauster superior to a rotary?"—"Is it economical to use water gas as an enricher in place of cannel coal?"—Votes of Thanks—Greeting to the Institute Meeting—Thanking the Directors—Adjourned.

Gas Associations and Their Mutual Relations, by Mr. C. J. R. Humphreys..... 795

Tar Firing, by Mr. Geo. R. Wadeson..... 796

How Fuel Gas Should be Made..... 797

ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 798

Santa Ana Cal.) Works in Hands—To Take Charge at Alton, Ills.—Not so Bad at Williamsport, Pa.—The Ammonia Manufacturers Combining—Public Lighting, Alameda, Cal.—Changes at Columbus, O.—In Possession at Plattsmouth, Neb.—Public Lighting, Green Island, N. Y.—The North Adams (Mass.) Company to Supply Electric Light—An Interesting Decision, Montreal, Can.—New Gas Company—The Operations of Messrs. Brown and Clark in Central New York—Annual Meeting, Georgetown, D. C.—Changes at Troy, N. Y.—Cheaper Gas for Marshalltown, Iowa—Will the Equity Charter be Annulled?—Public Lighting, Mt. Vernon, N. Y.—Kerr Murray Company Contracts—And Many Other Items.

Recent Patent Issues..... 800

The Market for Gas Securities..... 801

BRIEFLY TOLD.

ONE MORE FOR EGNER.—Some time ago we were called upon to report the fact that Superintendent Egner had been in receipt of a token from his employees, testifying to their appreciation of him as an employer, and now we are to chronicle that Egner's employers have emphasized their opinion of him as an employee. As master and man, Egner's course during his connection with the Laclede Gas Light Company has been marked by capacity and faithfulness; and it is gratifying to note that those high in authority in the corporation have not been blind to his fidelity; for, unfortunately, it is too often the case that corporations forget, or become indifferent. However, the plain facts in respect to the last testimonial presentation in which Egner figured are about as follows:

On May 30th last a meeting of the Directors of the Laclede Gas Light Company was held, and many weighty matters were discussed during the conclave. Harmony marked the proceedings, and towards the close of the session the following resolution was offered and adopted:

"We, the Board of Directors of the Laclede Gas Light Company, of St. Louis, by resolution adopted, request the President of the Board to prepare and tender to Mr. Frederic Egner, Engineer of the Company for more than five years past, in recognition of their esteem for his ability and services to the Company, a gold medal, with suitable device and sentiments engraved thereon."

The resolution was signed by the entire Board, and the Committee to whom was delegated the task of procuring a suitable testimonial wasted no time in dawdling over their instructions. On the afterncon of June 6th the medal was presented to Mr. Egner by Capt. Keiser, who was peculiarly happy in his presentation speech. Egner hardly did himself credit in his reply, but who can preserve his equanimity at stolid pitch when sentiment will insist on showing its lymphatic presence. The token shows an engraving of a triple-lift gasholder on one face, while the other bears the following inscription:

"*Presented by*
The President and Board of Directors of the
Laclede Gas Company
to
FREDERIC EGNER,
in recognition of his ability as a Gas Engineer,
and as a token of confidence and esteem.
St. Louis, June 1st, 1889."

The best thing about Egner, however, is that all these attentions do not inflate him with an undue sense of his own importance.

As was briefly noted in our last issue, the end of the long, plucky fight of the Laclede Gas Company with the St. Louis Gas Trust, composed of the old St. Louis, the Carondelet, and the Gas Fuel and Power Companies, came to a practical termination in the resignation of a part of the old Laclede Board, and the election of Mr. Emerson McMillin, of Columbus, Ohio, to the Presidency of the Company. The companies will shortly operate under the Laclede charter and the Presidency of Mr. McMillin; and thus it came to pass, as Mr. Socrates Newman, former

President of the St. Louis Gas Company, rather tersely expressed it, "The tail wagged the dog, after all."

At the annual meeting of the Newark (N. J.) Gas Light Company the following Board of Directors was chosen: Messrs. Eugene Vanderpool, Ira M. Harrison, Theodore Runyon, Edward H. Wright, Jno. R. Emery, Marcus L. Ward, R. F. Ballantine, Franklin Murphy and H. N. Congar. The Company's affairs never were more prosperous, and it would seem to be a question of but short time, provided the present ratio of increase in sendout is maintained, when Mr. Vanderpool will again have to call on the constructors of gas works apparatus for enlarged manufacturing facilities.

Judge Seney, of the Circuit Court, Allen County, Ohio, has reversed the judgment rendered by the Court of Common Pleas in the suit of the Lima Gas Light Company against the authorities of Lima. The judgment of the lower Court was in favor of the city. The suit was brought to compel the city to pay for gas supplied for public lighting during 1888, despite the fact that on April 4th of that year the Council passed an ordinance repealing that part of the ordinance of December 3, 1883—at which time the city agreed to light its streets with gas for a period of 9 years from Jan., 1884—which bound the city to use the gas of the Lima Gas Light Company. In the spring of 1888 the authorities determined that too high a price was being paid for gas street lights, and the Company was ordered in due time to cease its service. This it declined to do, but kept on under the contract and at the proper time presented its bills for the service rendered. The city declined to pay, and legal measures were instituted, with the result stated above. Judge Seney writes a lengthy opinion in support of his ruling, and no doubt this case will exert a marked influence hereafter on the history of gas controversies in Ohio. Among the Judge's remarks we find the following:

"Section 2482.—A neglect to furnish gas to the citizens and other consumers of gas, or to the corporation by any company in accordance with the prices fixed and established by the Council, from time to time, shall forfeit all rights of such company under the charter by which it has been established; and the Council may proceed to erect, or by ordinance empower any person to erect gas works for the supply of gas to such corporations and its citizens; provided that nothing in this section, or in sections 2479 and 2480 shall operate to impair or affect any contract heretofore made between any municipal corporation and any gas light and coke company." In respect to this Judge Seney says: "The establishing of a gas plant requires the outlay of considerable money. It is a risk depending upon a great many contingencies as to whether it will be a success. While it is thus upon the one hand, upon the other it is a great advantage to the city. Among other things it enables the city to enforce with greater security its police powers. Its establishment is for the mutual benefit of both city and gas company; so the Legislature in its wisdom has thrown safeguards and protection around both, preserving to the city the power of contract, and to the gas company its life and existence, subject to the power of contract. Section 2479 permits Council to fix the price of gas for a period not to exceed 10 years. Section 2482 provides that only upon the failure of the gas company to furnish gas at the price fixed can the Council elect or empower any persons to erect gas works to supply gas to the corporation and its citizens. This is simply saying to the gas works company, as long as you live up to the ordinances of the city the city will not enter into competition with you, or permit anyone else to as far as furnishing gas to the city for public purposes is concerned. In the case at bar the price of gas was fixed for 9 years; for this period of time the Council cannot require the company to furnish gas for a less price. They cannot furnish gas themselves, they cannot permit anyone else to at a less figure for corporation purposes, otherwise they would be indirectly lowering the price of gas, which by the express terms of the statute they cannot do directly. Bearing in mind that the interests are mutual, from what source will the city get its gas to light its streets and public buildings? No one can furnish it except this gas light company. Again, by the express terms of this statute, at the expiration of a term of 9 years, Council can change the price of gas, and not until then." Having pointed out the nature of the contract Judge Seney holds, in effect, that because the city had the worst end of the bargain this is no reason why the company should not legally enjoy to the full the advantage accruing to it from the same bargain.

Chas. A. Ashburner, the well-known geologist, was last week made a Doctor of Science, through the action of the University of Pennsylvania. In conferring this title upon that eminent Pennsylvanian the Regents acted wisely and well.

[Official Report.—Concluded from p. 764.]

Twelfth Annual Meeting of the Western Gas Association.

Held at Cincinnati, Ohio, May 15, 16, and 17, 1889.

Second Day—Afternoon Session.

The President—Next in order comes the paper by Mr. L. P. Gerould (Mendota, Ills.), entitled

POINTS ON THE MANAGEMENT OF SMALL COAL GAS WORKS, AS DEDUCED FROM TWENTY-FIVE YEARS' EXPERIENCE.

[At the request of the author, the paper was read by Mr. E. H. Jenkins, of Columbus, Ga.]

Mr. President and Members of the Western Gas Association:—It may seem egotistical in me, a new member, to think that I can give you any new points in the gas business; but if I am able to suggest any ideas that may lead to a profitable discussion of our business I shall be amply repaid for my attempt.

Having been a member and present at the conception and birth of the New England Association (the mother of all American Associations) and having always taken a deep interest in meetings of that and like Associations, I give it as my opinion that they have been of incalculable benefit to the profession, and through them to the stockholders and consumers.

The policy of many companies of not being willing to pay the expenses of their managers or superintendents to attend these gas meetings is all wrong. I believe that the cost of sending an intelligent superintendent will be returned fourfold in the profits of a company. The smaller the company the greater the need of their doing so. The salary they pay their managers or superintendents is so small that they cannot afford to attend these meetings. I think that every company should subscribe for all the leading gas light journals for the benefit of their employes. Some will say that all of the papers and discussions are published in the papers, so there is no need of sending their managers to the meetings.

I have found that while the papers and discussions have been instructive, the little chats I have had outside of sessions with members of the profession, and the comparing of notes have been by far the most instructive.

A gentleman who is president of a large number of the small successful Eastern companies, told me that the money that his companies invested in sending their superintendents to gas meetings was the best expenditure they made.

You can tell the moment you enter the retort house of any works whether or not the superintendent belongs to any gas Association.

There are also other points to which I wish to call your attention:

First.—The retort house, where the largest share of money is saved or lost by gas companies.

Much to my surprise I have found companies here in the West who send out from 10 to 100 millions per year, who keep no journal of manufacture, which I consider is the most important book of the company. Such a book should be made in this way: It should be ruled so as to give a column for station meter register, one for gas made, one for gas sent out, one for gas on hand, one for increase or decrease, two for coking coal, one for enrichers, one for yield per pound, one for retorts in use, one for bushels of lime used, one for temperature, and one for weather record, with a wide margin on the right hand side of the page for the record of coal bought and used, so as to show the amount on hand at the end of each month, and also one at bottom of page to give room for footings.

Second.—Gas book-keeping.

At your meeting last year you had a very able paper* from Mr. J. D. Thompson on this subject which was of much interest to me.

The system of book-keeping now in general use by the small companies in the West is very cumbersome, and it requires most of the superintendent's time to keep it up.

After many years of study and observation I have compiled a system (which I have used for a term of years) that will make the bookkeeping department easier and cheaper than the old system, which I will describe with the aid of proof sheets that I have for your inspection.

Of the collection books the first and most important is the meter statement book, which is the book of original entry, and it is the only one of use in a court of law. You will see by the proof sheet that it is ruled differently from the books now in general use, as there are two lines for each consumer. To illustrate the way of using it we will say you start

*See Journal, June 16, 1888, p. 426.

the book January 1. Put on the consumer's name, ledger folio, number of meter and size. At the head of column you enter in ink the meter statement of December 1, then enter the January statement on the first line, then subtract the December statement from the January statement and enter on the second line. Now you have the number of feet consumed, from which the bills are made out. Then enter bills on gas ledger. This ledger, which, I think, is new to most of you, was designed by Mr. C. F. Hunt, the very efficient book-keeper of the Manchester Gas Light Company, of New Hampshire. You will observe that this ledger takes the place of the meter register and bill book of the old system. It is to be used in this way. Enter the consumer's name and number, which has to be done only once in three years. Now, to make a meter register you enter, over the head of column marked "Number of Feet," the December meter statement. You will see that by adding the number of feet to this statement you get the statement for the 1st of every month in the year. In case the meter is changed at any time, interline the statement when changed. In this way you get rid of the clumsy meter register book that the names have to be entered upon four times a year; also the bill book.

We are now ready for the collections. The bills collected are entered daily on the day cash book either by name or number, amount collected and number of feet of each bill. For convenience I foot up the column each day and carry the amount to a blotter cash book, on which I keep my daily payments, balancing the same every day. At the end of our discount days we close our collection book and enter all unpaid bills on an overdue book, which is ruled for amount due and number of feet, the footings of which, added to the footings of the day collection book, give the sales and receipts for the month. Then post from the day-book into the ledger the amount of each bill received.

The treasurer's cash book is ruled with columns for the different accounts transferred from each day's receipts and payments. The rest of the books are the usual treasurer's journal and ledger, now in general use for double entry book-keeping.

I have also with me a book of blanks that are used in this system of book keeping.

I wish to call your attention to the retort house report, which takes the place of the slate now almost universally used. The record is kept with a lead pencil, which is not so easily erased.

This system of book-keeping is copyrighted. The Skeen & Stuart Stationery Company, No. 77 Madison street, Chicago, Ills., are the only authorized makers of these books. The epithet, "thieves and robbers," as applied by the press and growling consumers to the gas fraternity, should not apply to gas superintendents, for they, as a class, have no reason to blush at their record as compared with that of other business men in positions of trust and responsibility. It may apply to presidents and directors of many companies, as they commence by robbing their own pockets by trying to manage their companies, instead of giving the management to a competent superintendent.

I find many superintendents who do not have the confidence of their directors, and, therefore, do not take the interest they would if they were wholly responsible for the success of their companies. The directors of many companies try to earn a large dividend on excessive capital.

Ten thousand dollars on every million feet of sales is ample capital for model works, and with that capital properly managed, gas can be sold at a low rate and pay a good dividend.

I wish now to say a few words on electric lighting. Almost every one will tell you the electric light has come to stay. That may be true, but I think that the less gas companies have to do with it the better they are off. I have found that the figures of profits claimed by electric light agents should be divided by at least 100. If gas companies would put the same amounts of capital that they put into electric lighting into modernizing their retort houses and enlarging their street mains, they could fight any electric company with the assurance of winning. It has been demonstrated time and again that gas is more satisfactory and cheaper to the consumer. Most of the profits so far in electric lighting are made by the builders of the machinery and by the selling of rights. The poor stockholders look in vain for their dividends; and it will be worse for them in the future when they use meters and the consumers have to pay a profit on their light.

As far as I can see, electricity has not really injured the gas business, but has rather proved a benefit, for it has educated the people up to more light and stimulated gas companies to put forth extra efforts to compete with it. The electric light managers have proved this one thing, that not one gas consumer in ten has any correct knowledge of what his gas costs him by the year. He always remembers the large bills and forgets the smaller ones.

About the time when the bills are the largest, the electric hustler asks the consumer, "What does your gas cost you?" Of course he gives him the largest bill he has paid during the year. That gives the electric agent a chance to bid under four or five dollars a month, and the consumer thinks he is making a great saving, though really paying more; for usually his gas bill will not average the amount he agrees to pay for electric light.

Now you will see the advantage of the gas ledger I have described, for you can show every consumer just what he has paid every month or year, at once, without looking over your meter register and bill book.

Now a few words to my young friends who are just starting in the gas business. Do not think because you are appointed superintendent of a gas works that your business will increase, or that you can make a success without any effort on your part. Do not think that you know it all at the beginning, for you will find, if you attend these meetings, that there is always someting to learn.

Gentlemen, trusting I have not wearied you with my long paper, I will close with the following sentiment:

The *light* and *heat* of the future, not *electricity*, but straight coal gas, distributed through one system of mains in every city and village throughout our broad land. May the time soon come when a furnace or coal stove will be as great a curiosity as a tallow dip is to-day.

Discussion.

The President—Mr. Gerould's interesting paper is now open to discussion.

Mr. Boardman—I think that paper is an exceedingly interesting one, and that the author of it has a fund of information which merely needs to be tapped to pour forth knowledge. I hope that the drip pump will be put to him, and that all the knowlege he can give us will be forthcoming. I was about to apply it myself, but will desist; but I hope that some one will pump the gentleman successfully.

Mr. Dunbar—I do not agree with the author in respect to the position he takes about electric lighting. I believe gas companies can run electric lights cheaper than outside parties. He says here that if gas companies would put the same amounts of capital that they put into electric lighting, into modernizing their retort houses and enlarging their street mains, they would reap a larger benefit. If a gas company is to accomplish anything at all it ought to have a modernized retort house, whether running an electric light plant or not; and it will certainly pay to modernize it. We have had some experience at New Albany in conducting an electric light plant; and while its original proprietors could not make any money out of it, yet at the figure at which we took hold of it, we manage to pay dividends. We stopped all competition, and thus having everything our own way, the lighting field is ours. That is one great object in furnishing electric light. There is no reason why a gas company should not have a modernized retort house and furnish electric light at the same time.

Mr. Page—I move votes of thanks to the writer and to the reader of the paper to which we have listened.

Mr. E. L. Brown—I second the motion, and would say that I accidentally became acquainted with Mr. Gerould yesterday, when I applied the pump as well as I knew how (not knowing that he was to read a paper), and got a great deal of very valuable information from him.

Mr. Page—I will add a word. Coming, as I do, originally from away down in Maine, then stopping a while in Boston, and then a longer time in New York, I have counted, for certainly 20 odd years, as a great pleasure and privilege, the friendship of Mr. Gerould. At Manchester, New Hampshire, he made a record second to none possibly among the New England engineers; and coming now to the West I am sure that all who meet him will find him here, as he was in the East, willing to impart information, and without doubt, as expressed in the paper, expecting to get information. [The resolutions of thanks were adopted.]

OPENING THE QUESTION-BOX.

At the suggestion of the President, the question-box was now opened by the Secretary. The first question read was:

"*Are the results that are obtained in using long scoops to charge retorts in small gas works adequate to pay the increased cost of labor required?*"

The President—Certainly, someone has had experience in that direction.

Mr. Lansden—I can give my experience, but the question is hardly in such a shape as to be intelligible. To how small a set of gas works does it apply? On a bench of three retorts a long scoop will not pay, while on a bench of ten probably it would. Then, again, it would depend on how experienced the men are in charging. I think that over two benches of sixes it would pay.

Mr. Boardman—I wish other men in this gathering would get up and relieve a few of us from the necessity of doing all the talking. Here is a question that many in this room ought to be able to answer, but they do not seem to have anything to say. It seems to me that where under three men on a shift are employed in a retort house that charging with a scoop will not pay; if three men or over are employed on a shift it will pay.

The President—The next question is—

"*Are self sealing lids a success?*"

Mr. Somerville—No.

The President—That question seems to be answered.

Mr. Scofield—May I hear that answer?

The President—The answer was "No."

Mr. Boardman—Who made that answer?

Mr. Somerville—I want no personal allusions from you.

Mr. Runner—I say that they are a success.

Mr. J. B. Howard—Are there not some manufacturers of self-sealing lids in the room? That is a very personal matter—to make a decision without giving a fellow any chance to reply.

The President—No special lid is mentioned.

Mr. Dunbar—I would like to ask the gentleman who said self-sealing lids are successes if in his use of them he finds them to be gas-tight; or if he finds it necessary at any time to use any luting?

Mr. Runner—My reply is that we find it necessary to use some luting; but we also did so when using the ordinary luted lid.

Mr. Jenkins—Where, then, is the advantage of self-sealing lids?

Mr. Runner—In a saving of labor, and the fact that you do not have to keep a large stock of luting material on hand.

Mr. Egner—I believe it depends upon the locality as to whether luted lids are successful or not. In St. Louis the clay we use for luting does not cost us anything. In fact I believe they would pay us for the privilege of dumping their clay in our yards. Of course, in such situations self-sealing lids would not be much of a success. About 16 years ago I was connected with the New York Gas Light Company, and the retorts were fitted with the McIlhenny lid. They worked very well. They would leak occasionally, at which times we had to use a small amount of luting. At the Metropolitan Gas Light Company (N. Y. city), with which I had been connected before taking service with the New York Company, a lid made of plate iron was very much favored by the engineer, who claimed that it was a great success. He, however, was the chief owner of the patent. I visited the works a number of times to see how successful they were, and every time that I got into the retort house the lids were perfectly tight. I found out afterwards, though, that the foreman kept a bar of soap on hand, and whenever a visitor was seen to be making his way into the retort house the watchful foreman applied the soap to any slight crevice around the lid. So, if you have a lot of soap on hand, and the lids themselves don't cost much, why, then, they are a success; if not, they are not.

Mr. Walsh—In the paper on inclined retorts I advocate self-sealing lids at both the upper and lower ends; and so far as we have observed they have been used with perfect success. Occasionally a leak will develop at the lower end; but that is easily remedied—it is usually due to the fact that the condensation of the tar prevents the seal being perfect. I do not know positively who the manufacturers of these lids are—I think they are made abroad; but they are certainly excellent. At the upper portion of the retort no leaks are ever developed. So far as that one bench is concerned they are a success.

Mr. Lansden—As Mr. Egner says, in St. Louis the cost of luting was very reasonable, as they were ready to dump the clay down in the yard. The Washington (D. C.) works had self-sealing lids when I went there, some of which had been in use for over 15 years. Last year a few of these had to be removed. Once in a while, when the men are careless, a trifling deposit will interfere with the action of the lid, and there would then be a slight leak, which can be easily stopped by a bit of luting material. At Washington it would cost us at least $10 per day were luted lids used to the exclusion of all others—luting material is comparatively dear at Washington—whereas at St. Louis they were glad to haul the clay and dump it in our yards. In the latter place I had to keep three men at work in luting lids.

Mr. Dunbar—Then you find it necessary in your work now to use a small amount of luting?

Mr. Lansden—Sometimes. Five retort doors may shut tight every time, but in the sixth a man in drawing the charge may through inattention permit a trifle of tar or a bit of coke to adhere to the face of the lid, when, of course, the self-sealer does not close as true as it should. A bit of clay, however, remedies the defect.

Mr. Somerville—I would not like the impression to go abroad that I am opposed to self-sealing lids. Of course, I understood how that little pleasantry occurred, because some man did me the honor to criticise a statement that I made about it in the American Gas Light Journal. I have often thought that a rational device at a reasonable price (when you could remove the lid after it had been used for a year or so—for they work very well for the first year or so, after which time the parts begin to warp because of expansion and contraction, when they begin to fail) by which you could take the lid off, put it in the machine, and pass a planer over it, thus virtually renewing the lids, I think the problem might be considered solved. I throw out the suggestion to our machinists to think over that matter. Perhaps such a thing can be put up for that purpose.

The next query was—

"*Should any coal gas maker use Lima crude oil as an enricher; if so, where?*"

Mr. Shelton—Mr. Hallett, of Springfield, Mass., uses it, and it is also used at Holyoke, in the same State. I think I can say it is successfully used in both places.

Mr. Egner—I beg pardon for rising again, but as this is a matter in which I have had a great deal of practical experience, I would say, as with the lid, that it depends very much upon where we are located whether it is best to use crude oil, Lima oil, or naphtha for enriching gas. We have used both at St. Louis, and in large quantities. I find with the coal we use, when used alone, that we have a great deal of naphthaline, which is deposited in the service pipes—in fact, almost everywhere; and that when we used crude oil the latter did very little good except to enrich the gas. It was a good enricher, but did not remove the naphthaline. When we used naphtha it would remove all the naphthaline, and we had absolutely no trouble. Our street inspector, Mr. Taylor, is in the room, and he can say how much trouble we had before and after we used oil. If I had a water gas apparatus I would use crude oil; but, using coal, and running it into the retorts as we do, I would recommend using naphtha and not crude oil.

Mr. Mitchell—I think Mr. Gimper has had some experience in the use of Lima oil.

Mr. Gimper—We at Leavenworth are using oil as an enricher. Some time ago I adopted Mr. Egner's process of using oil, but have now given it up and adopted another one. The question here, however, is, "Should we use oil as an enricher?" I think we should—at least in our situation. Our coal is poor. We do it to increase the candle power. It imparts to the gas a better light. We have now been using Lima oil for more than a year, and very successfully.

Then followed the query—

"*Is a steam-jet exhauster superior to a rotary?*"

Mr. J. B. Howard—Some years ago I was an enthusiast on the jet exhauster, and I am still a believer in its efficiency for a small works, where they do not want to go to the expense of putting in the rotary; but I now believe there is a limit to the jet exhauster. As the works increase and the output grows larger, I think the jet exhauster can be profitably replaced by the rotary. I have had considerable experience in taking care of naphthaline in the jet exhauster, practically so as to know the difference whether the jet exhauster makes naphthaline or whether in using a rotary you will be clear from it. I am speaking now practically upon that question. Two months ago I purchased a rotary exhauster, placed it in position, and commenced work with it. Prior to that, working with a jet, we had some difficulty in relieving the trouble caused by naphthaline; of course it took only very little time anyway, but, however, it had to be done. The jet would make naphthaline. Since putting in the rotary we have not got the seal off once yet, in a month of running, and my purifying man has since said to me, "Sure I don't know what I will have to do. I am not employed all the time now, as I was with the jet." The rotary certainly gives much better satisfaction for a certain output than the jet; but for small works I still maintain that, where they don't want to go to the expense of a rotary, a jet exhauster ought to be put in—anywhere from three million cubic feet per annum up, no works can be properly run without some sort of an exhauster. In works of the capacity mentioned it is profitable to put in the jet. Of course, they have to take the consequences, and look out for them; while it may be that, under certain conditions and with certain coal, they may have no trouble at all, because from some coals you have no naphthaline. Those using Illinois coal don't know anything about it; but those using Youghiogheny, second pool, may have trouble from it. It is very easy to take care of it. It gives no material trouble. It is only a little care now and then; that is all.

The next question was—

"*Is it economical to use water gas as an enricher in place of cannel coal?*"

Mr. Boardman—I will say that I have had an experience in the last eight years in the use of water gas as an enricher; whereas for several years before that I had used other enrichers than water gas. In the meantime I have been set upon by one of those companies that come in to benefit the communities by giving cheap gas, and we have fought it out on that line, although it took all summer. I must say that I have to thank water gas as an enricher, for it has enabled me to retire with flying colors. I used oil as an enricher, and tried cannel coal. They both enrich, but neither of them gave me the success as an enricher, in that whiteness of flame which is so alluring to the ordinary consumer, as the water gas which I have used. I have been enabled, at a very small expense, as compared with any other form of enricher yet put upon the market, to get a white gas of 20-candle power, which has stood successfully against pure water gas of 20 to 22-candle power, without the smoke and the stoppage of burners incident to too rich or pure water gas. I shall, therefore, have to say that water gas is a good enricher for a coal gas plant.

Mr. Lansden—I suppose it is intended that those of us who are here should give their experiences. I have been for three years now making a mixed gas. I find that the water gas apparatus, where we are, is very valuable. We have fluctuations at certain seasons of the year. We try to average it to about the proportion of 33 per cent. of water gas to 66 of coal gas. We keep so many benches running to make that proportion of coal gas; and we have the generator running for an hour, or an hour and a half, and can supply an increased demand. I think the amount of carbonic oxide passed into the gas as a supporter gives it an extra amount of heat, so that the carbon is more thoroughly burned. We do not have the same trouble from smoky gas that we had when we used cannel coal as an enricher—if we go beyond 16-candle gas. We send out 20 or 22-candle gas ordinarily, with three-quarters coal gas. I find that the mixture makes very little difference. There is another thing. For a small works it settles the question with regard to the use of coke. Where there is no demand for coke you may make water gas with the coke, and you can meet the fluctuations more easily. There is no trouble at all in mixing the gas.

Mr. Page—While not a practical gas maker, yet, as you know, I have had some experience in observing gas making here and abroad. When abroad I have been surprised—though not exactly that either. I have never found an English gas works using either naphtha or oil as an enricher, but always using cannel coal; although the average cost of cannel coal in England is nearly as great as here. You may say that it is perhaps because oil costs more there than here. Its cost is very little more, because the oil in Scotland is obtained in enormous quantity, and is laid down in Liverpool and London at about the same price as it is sold in the United States; and the Russian crude oil is delivered there as cheaply almost as our Lima oil is here—or at a very low cost. Still the English gas maker does not use either naphtha, oil, or water gas as an enricher. He would use it as an enricher for two reasons—if either of those two reasons prevailed—if it were either cheaper or better. If an English gas maker can make a saving of a half, or a quarter of a cent. per 1,000, he thinks it is a large saving. And so, if it were cheaper, he would use it; or if it were better he would use it. Gas consumers, when they find that naphtha is being used as an enricher, or that Lima oil is used as an enricher, or that water gas is used as an enricher—they don't like it. I rarely find a consumer who don't detect it, if he is an observer. When coal gas comes through his pipes he observes that it burns in a certain way; so also when he finds oil gas, or naphtha, or crude Lima oil gas coming through, he observes that it burns in a different way. I am not one who believes that they will mix thoroughly. I don't believe that you can make them mix thoroughly. I believe that when a gas maker puts naphtha into his red-hot retort, he will plug up his purifying apparatus with solid lamp black in two or three weeks. I believe if you want to make gas at a figure that the English gas makers are compelled to make it at, you would all use cannel coal. I believe if your gas was inspected as the English gas inspectors inspect the gas there, you would have to use cannel coal. I want to make these statements as from results coming under my own observation. Then there is the great danger of explosion where naphtha is used. I apprehend that my friend makes water gas because it can be more quickly produced when it is suddenly called for. That is the way I look at it, although I may be looking at it from the wrong standpoint. You make it quickly, and send it out, and the consumer takes it and pays for it; but he will swear when that stuff comes to him—I mean when that so-called gas comes to him. I want to put myself on record as not believing that it is economical, or as believing it to be a good thing to do.

Mr. Lansden—May I ask Mr. Page a question? In England I do not think they call for any such candle power as we have to have here in this country. If you distribute electric light over London as it has been through these United States, you will soon find that the English works will be compelled to take up something that will make a higher candle power than cannel coal. This is the reason why it is not the same question at all there as it is with us here. Some time ago we had occasion to send to New York, where much the larger proportion of gas sold is water gas, to request Prof. Love, the City Gas Examiner, to test New York gas with the burner that he used ordinarily, and then to test the gas with the burner that I am testing by. At noon of each day our Washington gas is tested, and I venture to say that there is not a gas man in the United States or in London that is held down as we are at our works. Dr. Love tested the same gas with the two burners, and there was almost 6½ candle power difference between the burner used in Washington and the burner used in New York, as to candle power.

Mr. Boardman—In whose favor was the difference?

Mr. Lansden—The New York gas showed 25.90 candle power through the Bray burner used there officially, but the same gas through the 15-hole Argand burner, as used in Washington, showed but 19.42 candles.

Mr. Page—As to candle power, the English gas consumer is perfectly satisfied with 16 to 17.

Mr. Boardman—If we can make our consumers satisfied with that, we could use cannel coal; but we cannot do so.

Mr. Page—The water gas advocates came among us and said, "We are going to sell you 30-candle gas." But they never have done it. They have made, accidentally once or twice, 25 or 26 candles, but they soon get down to between 21 and 22 candles. If they make 25, 26, or 27 candles they have to put in more naphtha than it will be profitable for them to do. Therefore, this cry for higher candle power, as a compulsion upon the part of the coal gas men, ranging up from 17 to 20 candles, has come simply from that application of the gas consumer. The consumers were satisfied with 17-candle gas when you were making it ten years ago. They will be satisfied with 18 or 20, and they will get a more satisfactory light from that than from water gas of 27, 26, 25, or 22 candles.

Mr. Shelton—I do not think we are to be guided here by what they do in England. Are we not independent enough to do what we think is best in this country? When I find that the gas men in all our Associations are repeatedly talking about putting in water gas as an enricher, I think it is a matter worthy of our serious consideration. I don't think we need follow England as a model in making our gas works. (Applause.)

Votes of Thanks.

The Question-Box having been emptied, Mr. McMillin offered the following resolutions thanking the parties who had contributed to the entertainment of the Association:

Resolved, That the thanks of the members of the Western Gas Association, in attendance at the Twelfth annual meeting are due and are hereby extended to the Chamber of Commerce, Addyston Pipe and Steel Company, Cincinnati Gas Light and Coke Company, the Marmet Company, American Meter Company, Stacey Manufacturing Company, Maryland Meter Company, Phillips Stove and Meter Company, Mitchell, Tranter & Company, Consolidated Tank Line Company, O'Neil & Company, Walton & Company, W. H. Brown's Sons, Clark & Hawley, Covington Gas Light Company, C. I. St. L. & C. Railroad, for their courteous and successful effort to make our stay in Cincinnati an extremely pleasant one.

The resolution (seconded by Mr. Somerville) was unanimously adopted.

Mr. McMillin—I have still another resolution to offer, and it is this:

Resolved, That the thanks of this Association are due to our retiring President, Mr. Geo. G. Ramsdell, for the able and impartial manner in which he has conducted the affairs of the Association during the past year. (Applause.)

Mr. Boardman—In seconding that motion I wish to add a word, and that is, that few of us here understand the difficulties which surround the Executive officer or chairman of such an assembly. I would further suggest that our thanks as therein tendered should express in a measure our appreciation of the firmness with which the President has passed upon all questions, the steadfastness with which he has upheld our Constitution and By-laws, and the courtesy which he has extended to every participant in the discussions of this assembly. With these remarks I heartily second the resolution. (Applause.)

The Secretary—Gentlemen, it is moved and seconded that the thanks of

this Association be tendered our retiring President, Mr. Geo. G. Ramsdell, for the able and impartial manner in which he has presided over our deliberations. Those in favor of that motion will kindly rise. [All present arose.]

The President—Gentlemen, I think the thanks ought to be the other way. Neither by nature nor training can I claim to be either a parliamentarian or public speaker; hence what I have done has been rendered more a success from the fact of your leniency than because of any ability on my part. I thank you for your courtesy.

Greeting to the Institute Meeting.

Mr. E. L. Brown—I understand that three of our members (Mr. Emerson McMillin, of Columbus, Ohio, Mr. Geo. S. Page, of New York, and Mr. Geo. T. Thompson, of St. Louis, Mo.) are very soon to journey to Europe, proposing to visit the meetings of the British, French and German Gas Associations. I would suggest whether possibly they might not have some official position, if we choose to call it so, from this Association; and whether letters to that effect might not be given them by our President and Secretary to those Associations to represent us.

The President—Do you wish to send them as delegates?

Mr. E. L. Brown—As may be decided by the meeting. I will make that motion if it is thought best.

Mr. McMillin—It is exceedingly unfortunate that I happened to go over to my friend Brown a while ago to ask him what his resolution was about. (Laughter.) I suppose you all saw it, and, therefore, I had better explain. When I saw that he had a resolution I did not know but what it was on the same subject as mine, and if so it would be better worded. I did not have a hand in making up his resolution, I assure you. I had not thought about going abroad in any official capacity for the Association, but since that subject is brought up, perhaps if our friend Page would tell us how he was received when he was sent by this Association once before, we could better determine whether to send any more delegates or not. (Laughter.)

Mr. Page—Mr. President and Gentlemen: I am glad of this opportunity which has been brought to me by my friend McMillin; and it is proper that I should make the acknowledgment. I regret that I did not bring with me the letter—I have been some time from New York before coming to Cincinnati, otherwise I would have brought a letter (which I will send to the Secretary) to be preserved in our archives—from Mr. W. H. Bennett, Secretary of the Gas Institute, of Great Britain, signed by Mr. Bennett, and by the late President, Mr. Chas. Gandon, of the Crystal Palace Gas Light Company. There were present at the Gas Institute meeting of a year ago 150 members of the French Association, and on the platform sat the distinguished engineer, Albert Ellissen, late President of the Societie du Gaz en France, or the French Association of Gas Engineers, the European Director of Imperial Continental Gas Light Company, and representatives of the gas light companies of Austria, Germany, Switzerland, Italy, France, Belgium and Russia. There were also in the circle, in the front row, as is their custom in England, the Council. I saw many old and familiar faces, and some that were new to me. Among these were Geo. Livesey, of the South Metropolitan, Chas Hunt, of Birmingham, Wm. Foulis, of Glasgow, Robert Morton, of the London gas works, Magnus Ohren, of the Crystal Palace Gas Company, and many others, whose names you doubtless saw in the papers—whose names often appear in the London *Journal of Gas Lighting*, and often in the American Gas Light Journal. When the announcement was made by Mr. Gandon that a delegate was present from the Western Gas Association, even at the mere announcement and before I had been called to the platform, there was at once not only audible applause, but cheering. When, by invitation, I walked down to the platform the acclaim became more pronounced, and as I stood between Mr. Gandon and Mr. Ellissen it was continued certainly for three or four minutes. I never was received anywhere with such cordiality and such remarkable honor as by the Gas Institute of Great Britain, going there as your delegate. I did not know at first just what to say. (Laughter.) I was a little surprised at myself. When Mr. Bennett, the Secretary, handed me, at the request of Mr. Gandon, the President, the letter to be read, which you sent to the Gas Institute, I collected myself and presented your credentials. At each paragraph there was applause. You may recall that the letter named over the nationalities that were represented in this Western Association. If I remember, there were some 10 or 11 different nationalities mentioned. First came the English, and then the English engineers applauded; then the Scotch, and then they applauded; and among them were Wm. Foulis, of Glasgow, Robert Mitchell, of Edinburgh, and John McCrae, of Dundee. Then the Irish, and they applauded. And when I came to the French, they broke out with the Frenchman's "Vive! Vive!" At each paragraph, as I referred to your location in this grand section here in the Valley of the Mississippi, and gave its population, its increasing population, I received applause. At the close there was again applause; and as I took my seat they continued applauding, until they asked me again to go to the front, and I attempted to make a speech. During the succeeding festivities and at the meetings I was called upon, and had the honor of being elected a member, as were also Mr. McMillin, Mr. Harbison, and Mr. Humphreys. They were particularly interested in the subjects of water gas and electric lighting. I was all right on those questions. (Laughter.) At their banquets, at their luncheons, and at their excursions I received always the most courteous attention—being seated close to the President on all those occasions. And in returning again, as we hope to have the pleasure, to be present at their meeting in June, then accompanying the English engineers, who are invited by the French Institute to visit them at Paris at their exhibition, and attend the meeting there next month, I shall be happy to be in the company of so good a man as McMillin, to do the talking for me, and of our young friend Thompson, who will take many notes, and who will take along his Kodak, and who will catch everything going with his camera. We hope there will be something that we may bring back to you at the meeting of the Western Gas Association in St. Louis next year.

Mr. Brown—Then, if it is thought best, I will make the motion that these gentlemen be sent as delegates of this Association. [Seconded by Mr. Boardman.]

Mr. Somerville—I think perhaps we had better think over this a little. It is something quite unusual to do. That might be establishing a kind of precedent—sending those gentlemen over to Europe as delegates from the Western Gas Association. When we turn them loose like that we don't know what they are going to do. If some old man like myself were going with them, then it would be all right. But I feel that maybe, and in all seriousness I believe, we ought to think it over first; because it has not been the custom to do such a thing as that. I think, perhaps, it might be best, as they are going over there, to send a cordial greeting of the Western Gas Association by the hands of those gentlemen, or something like that. Not as delegates, but as a hearty and cordial greeting from the Western Gas Association to our cousins across the water.

Mr. Page—I told John Somerville, who is one of the engineers of the Metropolitan Gas Light Company, and a brother of our good friend James, that I would bring him with me next year; and I will endeavor to do so for the reasons he has mentioned.

Mr. E. L. Brown—I will accept the amendment.

The President—Something prepared by the Secretary—is that the idea?

Mr. Somerville—Yes.

The President—Then we will take a vote upon the amendment, which is that the Secretary be instructed to prepare a suitable greeting for these gentlemen to take with them to the meetings in London, France, etc. [The amended resolution was adopted.]

Mr. Cowdery—I move that before adjourning we extend a vote of thanks to our worthy Secretary for the able manner in which he has conducted his office.

The President—I think that is very right and proper. Most of the credit of this meeting belongs to your Secretary and Treasurer. [Adopted by rising vote.]

Thanking the Directors.

Mr. King—We have had on our by-laws for a long time a section which provides that the Board of Directors shall meet and transact certain business; but that has been going by default for many years. On the first day of this meeting one of the Directors in my presence said: "If I am a Director I want to direct something; and I want to get the Directors together and have a meeting." They met, and evidence of their work has been apparent throughout the whole of this meeting. I think we should endorse their action in the meeting here, and vote them thanks for having done their duty.

Mr. McMillin—I second the motion of Mr. King, that the thanks of the Association be tendered to the Board of Directors. I recognize the fact myself that this is about the first time that the Board of Directors have ever done anything; and while we really do not know how much work they have done, we do know something about some of it. (Laughter.) I always go in for sustaining the Committee.

The President—It is moved and seconded that Mr. King and the rest of the Directors be thanked for the precedent they have established. (Laughter.) [Adopted.]

The Association thereupon adjourned.

[A paper read before the Society of Gas Lighting.]

Gas Associations and their Mutual Relations.

By Mr. C. J. R. Humphreys.

That the number of Gas Engineering Societies has increased largely both here and abroad the last few years is a statement that hardly needs to be proven by evidence—any one who is conversant with the gas literature of the day will accept it as a fact; and it raises the question, very naturally, whether this augmentation of technical societies increases or decreases the value of the older organizations.

Generally, perhaps, it may be said that the starting of a new society cannot decrease the value of those already in existence, unless its territory is carved out of the field of an established organization. Particularly would this hold true in a country of magnificent distances like America, where obviously a society formed—to take an extreme case—on the Pacific Slope would not interfere with the New England Society of Gas Engineers; on the other hand, where a new society must seek its support from a territory which is included in the area covered by an existing Association, then I think the effect of the former on the latter will be dependent on circumstances. Doubtless the members of the newer and smaller Associations would transfer a large part of their interest from the older to the newer society; and while they might not withdraw entirely from the larger body, yet their contributions to the literary programme of the latter would probably decrease by reason of the creation of the newer organization in their particular territory, when in such a case the value of the older and larger Association would be decreased by the formation of the newer society within its own borders, unless means were taken to counteract this effect; or, rather, the two societies were worked together in such a way as to add to the efficiency of the larger body.

With these general thoughts in mind let us glance for a moment at the various gas engineering associations now in existence in this country—their effect one on the other—and then endeavor to ascertain whether the value of each and all could be improved by working in closer compact one with the other.

First, we have the American Gas Light Association, as comprehensive as its name, entitled to draw its support from the entire American Continent, and as a matter of fact having on its roll of membership gas engineers from Canada on the north to Texas on the south and from the Atlantic to the Pacific coast. The Western Gas Association draws its support from the Western States. The Southwestern from the States of the region indicated by its title. The Ohio Gas Light Association gathers together the gas men from the State from which it takes its name. Whether the Central New York Gas Association and the Gas Engineers Association of Pennsylvania are still alive I cannot say. I believe an attempt was made to evolve a society in Connecticut—whether it really had an existence I am not sure; but believe a slender band of white ribbon was attached to the door knob of this State at a gas engineers' meeting a few years ago. The (New York) Society of Gas Lighting and the (Boston) Guild of Gas Managers represent the smaller, numerically, of such organizations.

That there is room for all these societies there can be no question; for each performs work which the other organizations could not do, and fills requirements which would be unfilled did not each Association exist. Thus it is clear that to no other organization could we turn if the Society of Gas Lighting ceased to exist and have our wants supplied as they are now; none of the other organizations could take the place of this Society. Many gas men, managers of the smaller gas works of New England, attend the meetings of the Association which takes its name from that section of the country who do not attend the American Gas Light Association, and would not if the smaller Society ceased to exist; and the same remark would hold true if transferred to the other districts of the country and their Associations. On the other hand, it is also true that these district Associations do interfere with the usefulness of the American Gas Light Association. In evidence of the truthfulness of this statement I would say that frequently, when in my office of Secretary of this Society I have been endeavoring to secure writers of papers for our fall meetings, I have met with the response, "No; I cannot write anything for the American Association, because I have to prepare an essay for the meeting of the Western Association. I cannot write two papers in one year, and I feel my first duty is to the home organization." An answer similar in substance to this I have frequently received. Substitute for the Western Association the name of the New England Society, and you could double the number of times I have received this reply. I doubt not that the energetic Secretary of the Western Association has received a similar response many times, only that the name of the Ohio Association stands in place of the Western, and the Western in lieu of the American; that is, a member of both the Ohio and the Western Associations will place his duty to the former ahead of the latter, while both will take precedence of the American Association. Consequently, every year increases the difficulty of obtaining papers, and it might almost be said that the standard of the dissertations is kept up better in the smaller societies than in the larger ones. Thus, as I stated a moment ago, the district Associations are interfering with the usefulness of the American Association, and the smaller district societies work against the larger one in its particular neighborhood—that the balance is on the right side, that the good they do outweighs the harm I am very ready to admit. Having said that I am not content to leave well enough alone, I am not satisfied that we should be content to drift along whithersoever the current takes us, resting at ease, because I know that the general cause is, in the main, being advanced; for I cannot but feel that were we all to work together we could all advance more rapidly, and the lead secured by one would not be at the expense of another.

What I ask for is more systematic and more united action on the part of all the Gas Associations. I would wish to see each society appoint from among its members a committee, which could be christened as its sponsors wished, but which might perhaps bear the name of "The Committee on Papers and Research."

In order that I might the more easily explain the duties of these imaginary committees, let us assume that each organization has a committee of this character. Say the Research Committee of the American Association has had submitted to it some knotty question (shall we say Naphthaline?), with instructions to secure all the information thereon and to report in print to the Association, and that they be empowered to draw on the treasury for their expenses. I do not wish to forestall the wisdom of such a committee, but it would seem to me that if such a question were submitted it would naturally divide itself into two parts, scientific and practical. Under the first head the committee would secure the services of a scientific expert to tell them all he could on the chemistry of the subject; and that he might better aid the committee, he would be called upon to aid them in the practical investigation. The second part of the investigation would be conducted by securing the help of certain members of the American Association to assist in the work by making certain observations during the year in regard to this subject.

The committee would, first, prepare a set of questions covering the details of the arrangement of the manufacturing plant, and each of the members assisting would be asked at the outset to answer these queries. Then the committee would prepare a definite plan of observations, which each of these members would be asked to have made, and blanks would be provided on which they could make their report to the committee monthly. I do not believe that it would be necessary to frame the questions in such a way, or to ask such a multitude of questions, as would put the members to any great trouble. A transcript of the record of the temperature of the gas at different stages of the process of manufacture, a statement of the state of the weather each day—these are matters of record by almost all gas companies, and it would give but little trouble to transcribe them for the committee; and if a further request was made on a member, to ascertain the nature of the soil surrounding services where he was particularly troubled with this deposit, and to ascertain the temperature of the soil at such points, this would hardly be considered a hardship.

I would, however, go a step farther; and this will explain what I mean by united action on the part of the different societies. I would have this Research Committee call to their aid the like committee of the other Associations, who would secure from their members a certain number who would assist in making the same observations, blanks being furnished for this purpose by the committee of the American Association. The committee of these district Associations would collect these returns, and, after taking a copy of the same, and making such deductions therefrom as the committee might deem warranted, pass the returns on to the committee of the American Association. That information of sufficient value to pay for this trouble would be thus secured I am inclined to believe.

But, it might be asked, Why this unnecessary machinery? Why not have the committee of the American Association apply direct to these parties, instead of working through the district Associations? Firstly, because many of the persons whose co-operation would be sought are not members of the American Association, and would not be likely to take this trouble for an Association of which they were not members. Secondly, because the committee of the district Associations would be better acquainted with the personnel of their members, and could thus the better designate who to call on for assistance. Thirdly, because the

comments on and deductions from the returns made by the district committees would be valuable. Thus, for instance, it might be justly said that such a committee of the Ohio Association, being well acquainted with the conditions prevailing throughout that State, could make such a commentary on the returns as would assist greatly the central committee in their work.

Let us assume another case. Let us suppose that the Western Association desired some information on "Carbonization," and that their Research Committee, after consideration, divided the subject into the following heads, "The Proper Duration of a Charge for Different Qualities of Coal;" "The Amount of Heat Required Practically in the Carbonization of a Ton of Coal;" "The Amount of Heat Theoretically Required in the Carbonization of a Ton of Coal." Many other and more pertinent divisions of the question could be made; these are mentioned because they occur to me off-hand, and will serve to illustrate my point, and will, therefore, answer my present purpose. Now it is, of course, true that the Western Association could find from their own members a sufficient number of men to take up these several questions and write papers upon them; but if all these subjects, and perhaps many more subdivisions of the one general subject, were to be brought up and discussed at one meeting of the Association, the meeting might have a certain sameness. My plan would be that the Research Committee would in such a case call on the like Committees of the other societies, and that each Committee should take one division of the subject, and designate one or more of the members of their Association to make experiments on that branch of the question and to embody the results of the investigation in a paper to be read at the next meeting of that Association. Thus, the question of "Carbonization" would be under discussion through the year by all the Associations, and would be discussed by the representatives of all sections of the country. If one of the Associations desired information on some of the disputed points of water gas engineering, substitute for the headings such titles as, "Deep *vs.* Shallow Fuel Beds in the Generator;" "The Proper Duration of a Run;" "Heavy Oils *vs.* Light Naphthas;" "The Proper Relation in Area between Fixing Chamber and Generator." Commit these several subdivisions of the question to the different Associations and you get the same result.

In a word, I would advocate having the different Associations discuss at least one subject in common through the year, and do it systematically. I would go a step farther. I would have formed, from the Research Committees, an Executive Committee, made up of at least one member from each Committee. This Executive Committee would meet once or twice a year and designate three or four of the general subjects which should be considered during the year by all the Associations, decide how these subjects should be subdivided, and designate which Association should take each subdivision. The Research Committee of each Association would then designate what members should write on, or investigate the special subjects thus committed to that particular Association. We would thus have at least three subjects which would be considered by all the Associations. And if we were to have all the papers read in response to this action of the Executive Committee, together with the discussions thereon, printed in leaflet style of uniform size and type, we would have at the end of the year some valuable papers in a readily accessible form.

If objection is raised to this scheme on the score of expense, I would say that traveling expenses and printing with some clerical help would represent the main expense, unless some abstruse question, requiring the employing of experts, was taken up; and, surely, there would be no difficulty in meeting these incidental expenses. I think it would be well to take up the scheme in this tentative way first—namely, in relation to the uniting of papers alone; then, if the scheme worked well, and it was desired to submit to the committees some subject for extended research, requiring the aid of expert chemists, I think it would not be difficult to raise the small amount of money thus required.

But it may be asked, as the Society of Gas Lighting is of a different constitution from any of the other societies and could not work fully with the other Associations in all points, why do I bring the matter up here instead of at one of these more general Associations. Simply because most of the members present are members, and, in some cases, officers, of the other organizations; and, therefore, if the scheme, modified as in your wisdom may be deemed expedient, should receive your endorsement it would be sure of earnest advocates at the various meetings of the different Associations, and would be well launched on the way to an early trial, which would mean, I think, the beginning of a plan whereby the usefulness of our various Gas Engineering Associations would be greatly enhanced to the great benefit of the industry, in what we all are so greatly interested.

Tar Firing.

By George Wadeson, in *Gas and Water Review*.

It is somewhat singular that in the great number of interesting papers which have been read from time to time, so little attention should have been given to the subject of tar firing, and that it should not have attracted the minds of gas managers and engineers generally, as it ought to have done, especially when we come to consider that the great quantity of gas tar that is now thrown on the market has so far reduced the price that it has become considerably more economical to burn the tar than to dispose of it at the low prices offered by the manufacturers of naphtha and artificial fuel, who are the chief purchasers and consumers of the article. However, my endeavor in this paper is to set forth tar firing in three different aspects, which appear to me to be thoroughly practicable, viz.:

(1) The wear and tear of the furnace in which the tar is burnt.
(2) The great advantages gained by using this fuel.
(3) The proper ways and means of using it.

(1) There is no doubt that the wear and tear of a furnace fired with tar are far less than when fired in the ordinary way with coal or coke. With the former clinkering is materially reduced, requiring to be done only once or twice a week, where the latter involves as many times a day. Now the mere deposit of this iron like substance called "clinker" is of itself very injurious to any furnace, particularly a brick one, so that we ought to aim at its reduction as much as possible. The clinker deposit in a furnace fired with coal or coke increases so rapidly that at the end of two months or so it is necessary to cut it out with an ordinary crow-bar, a process which tends greatly to destroy the furnace.

(2) Now having seen that the wear and tear of the furnace in which the tar is burnt are not nearly so great as that with ordinary fuel, we must turn our attention for a few moments to the advantages gained by using this tar. There are very few persons, I imagine, who have really considered the great advantages gained by the use of tar as a fuel; one cannot fail to conceive the utility of this scheme. If it be taken as a standard that tar is worth 15s. per ton for the purpose of fuel, then one must come to the conclusion that its adoption far economically supersedes that of ordinary firing. The value of tar as a fuel must depend upon the situation of the works, the value of coke and its disposal. I would say that if the works are so situated that it is convenient to have the tar conveyed by rail or water, there is no doubt that an advantage is gained by selling a certain quantity of it, if there is not a ready sale for coke, and the rest for firing; then, on the other hand, if the works are so inconveniently situated, or at any great distance from any tar distiller's works, there is therefore certainly a great advantage gained by burning it. Looking at it from these points, I maintain that coke is much easier disposed of than tar, seeing that it is of very little importance how the works may be situated, as coke is very largely consumed by manufacturers and for domestic purposes.

I shall now endeavor to demonstrate one or two different ways in which tar can be supplied to the furnace. The tar can be taken direct from the hydraulic main, in the bottom of which a 1 inch wrought iron ferrule, having a stop-cock attached, is screwed. A ½-inch reducing coupling is then put on, and this size of pipe brought down to the side of the furnace, where the tar is supplied to the trough through a nozzle of the proper dimensions. As the hydraulic mains will not supply all the tar necessary, a pipe should also be brought from a tank or cistern erected in some suitable position outside the retort house. If the tank is placed inside the retort house the dust arising from the coal mixes with the tar and hinders its flow. Into the tank a supply of tar should be pumped from the tar well as required. But to my mind, which I believe is most practicably used and certainly an advantage gained, is by having an elevated tank 14 ft. to 16 ft. above the furnace, or by a force pump giving a like pressure, and when practicable the tar should be heated to about 100° F. in its passage to the burner, which is easily done when heating retorts, by laying supply pipes along the stack; but where this is not practicable an oil lamp or gas jet caused to impinge on supply pipes in near proximity to burner answers equally as well. In some cases the tar is pumped from the well raw and cold, and travels a good distance, according to the position of the well, along the supply pipes to burner, and is only heated by passing along the retort stack.

However, I must not pass on without considering the economy of tar as a fuel, as it requires a considerably smaller percentage of tar than in the ordinary manner of firing. According to the latter system it would of course require at least one chaldron of coke per diem (24 hours), whereas the former would take on an average 2 galls. of tar, which are about equal to a bushel of coke; therefore the day's consumption

would reach in round numbers something like 80 galls; thus it is perfectly clear that if the market price of coke be 9s. per chaldron, or thereabouts, and that of tar 6s. 8d., or 1d. per gallon, it must stand to reason that with tar-firing the advantages gained are considerable from an economical point of view. The figures I have quoted above in favor of tar would, of course, tell up to a very large extent, on the right side, in the course of a year.

There is yet one difficult problem to be solved, which is one of the strongest objections raised against it, not only by managers and engineers, but by the public generally, on account of the great quantity of obnoxious vapor that is given off in using tar as a fuel when it is not properly managed. It will be easily understood that a little experience is necessary to enable the attendant to fully understand the quantity of tar by which complete combustion is to be obtained, and which in no case must be exceeded. The moment one atom of tar is sent into the furnace beyond that which can be thoroughly consumed, you have then the most hideous discharge of black smoke (carbon), which it is difficult to describe, but which can be easily appreciated. This being the case, we must remember that such escaped vapor means the loss of valuable fuel.

There is another point to which I should like to refer in passing, and that is the question of labor. From what has been said above, it is certain that there is a diminution—viz., clinkering is reduced to a large extent, and there is not that firing up each hour, as is the case with ordinary fuel.

Having considered the "wear and tear," and "the advantages gained by using tar," I will proceed to describe the third aspect of the subject—viz., "the proper ways and means of its use." There are, of course, many different modes employed, but it requires, however, a special contrivance to burn the tar to the best advantage, and without producing much smoke, which it does when burned in the ordinary furnace with smoke; and when so consumed the action of the flame is injurious to the retorts.

Mr. George Anderson invented a furnace specially adapted to the burning of tar with the best effect. It consists of an inclined plane of brickwork, terminating within a few inches of the back bridge, and corresponding to the tar space in an ordinary furnace. The tar is admitted at the front or highest end of the inclined plane, in the usual manner through a spout. It catches fire immediately it touches the heated brickwork, and trickles down blazing, always presenting a fresh surface, and it is thus completely volatilized and consumed before it reaches the bottom of the inclined plane. The earthy base of the tar which remains in the furnace in the state of breeze is pushed down and falls into the ashpit, through the opening at the brick bridge. When in operation the ashpit is kept full of this breeze in a red-hot state.

Air is admitted through an aperture in a door in front of the ashpit, which passes over the hot breeze into the furnace, meeting and mingling with the product of the combustion of the tar just as it is leaving the furnace to traverse along the retorts. By this mixture of warm air a perfect combustion of the volatilized substances is obtained, without the production of any colorless smoke at the chimney top.

Mr. Anderson has applied his system at several gas works with, I understand, perfect success. It would seem out of place in such a paper as this if I did not mention one of the principal methods adopted for tar firing. It will be easily understood that there must be a burner of some description or other employed to allow the tar to trickle into the furnace; the burner which I shall give for an example is known as Burtonshaw's "Excelsior" tar burner. It is adapted more especially to the heating of retorts from a setting of one to any number or dimensions whatsoever. It is very easily fixed, only requiring a ¾-inch supply pipe, which should be brought in a horizontal position from the tank to a suitable point near the hole in the door frame or brickwork of the furnace, and the brass tube of the burner is then placed inside the supply pipe, which is screwed up at the reducing socket and it is ready for use, and when it needs cleaning, once a fortnight would be found sufficient (not oftener, and not more than three minutes' work); when it is started the jet strikes on any available place into the furnace, so that the tar is scattered broadcast.

The results obtained by using this burner are, viz:

Far better heats are generated.

More gas per ton of coal.

Reduction in labor.

And less wear and tear.

As I stated before, there are other methods adopted by gas managers and engineers, either attended with success or failure, according to the construction of the furnace; invariably the case is, that when the tar does not burn properly, or is not giving satisfaction, they say it is the fault of the tar; but I maintain that in nine cases out of ten it is the manner of constructing the furnaces and the kind of burner used.

I think that I have said enough in this paper to make everything clear and straightforward in dealing with the three principal aspects of the subject of tar firing, which is certainly worthy of trial. It is my firm conviction that if it be carried out on the plan here set forth, perfect and entire success would most assuredly meet with the best results.

How Fuel Gas Should be Made.

The London *Journal*, in the following concise manner, thus editorially deals with this question:

The amount of attention that is now being devoted to fuel gas manufacture is perhaps the most satisfactory outcome of the water gas "boom;" for it is just possible that some permanent improvement in the methods of production and utilization of cheap gas may result from the study that the general question is receiving in all parts of the world. Engineers are always working at water gas problems in the United States; but now even Frenchmen, who have been forbidden by law to touch it, are discussing the same subject. There is one part of the question, however, which is of special interest for English engineers. It has been repeatedly shown that, as the raw material for the ordinary description of fuel gas plant, a non-coking coal or coke is required; but this condition is a serious drawback to the spread of the system, for certainly the greater portion of the cheap coals of the world are bituminous, and consequently caking. So far as can be ascertained from the conflicting reports on the subject, there does not appear to be any really successful process at present known for gasifying the worst and smallest bituminous coal refuse which is not worth carrying to a gas works and carbonizing in the ordinary way. Gas is made occasionally out of such material, but never as a matter of choice.

It is impossible to regard the fuel gas question as settled in the engineering sense until somebody shall have brought out a universally applicable process for converting into gas both the bitumen and solid carbon of the most inferior kinds of slack that cumber the ground around coal pits. This is the proper material for fuel gas. It is only half solving the problem to make gas of coal that can be used otherwise for any purpose. Such a process simply competes for raw material with other methods of consumption, and must therefore necessarily enhance its market value. Fuel gas will receive a fresh impetus if it can be made from material that is useless for any other purpose. It should not be beyond the power of science to extract the useful gases from slack which only differs in its physical condition from the best coal. It can be gasified in the retorts of a coal gas works; but it is so dirty, wet and sluggish under the action of heat, when lying compacted in a closed vessel exteriorly fired, that it is more economical to buy a cleaner material for making gas which has to be sold in a purified condition. It is an essential feature of fuel gas that it is not to be purified by chemical process. The mere fact of its being gaseous is sufficient purity for the purposes to which it is applied. Slack will not pay for handling as coal is handled for making illuminating gas. Neither is it good enough to permit of the waste that goes on in a water gas cupola during the process of "blowing up," or rendering the fuel incandescent by the air blast.

What is wanted is some such process as the following: The slack, however wet, dirty, dusty, sulphurous, or stony, should be tipped into the hoppers of the gas-making cupolas, and gasification should go on continuously and completely, so that nothing but gas and ashes should remain of the material put into the apparatus. There is no inherent impossibility in this scheme of operation; but it has never been carried out successfully for any length of time. Mr. George Westinghouse is understood to have been working at some such problem in Pittsburgh for the past year or two; but he is apparently no nearer a complete solution than he was when he began, notwithstanding the amount of money and the undeniable ingenuity he has lavished upon the work. Coal can be carbonized in closed retorts, and the resultant coke can be gasified in a blast of air or a current of steam; but the point that seems to baffle endeavor is to do the whole at once without waste, and so obtain the result in a condensed kind of gaseous fuel. The Siemens generators deal in a way with bituminous slack; but the product is very bulky, and only suited for immediate burning on the spot.

If coal could be gasified in the way we have indicated, without an unwieldy admixture of the incombustible gases, nitrogen and carbonic acid, it could be distributed to a distance, and the question of enlarging its range of portability by mechanical compression would be merely dependent upon determinable conditions. This is, therefore, the real problem of fuel gas for the future; and it is not touched by anything that

has yet been done by the later race of projectors. When these work for choice with soft coal slack, and turn out nothing but gas and ashes, the prospects of fuel gas in all parts of the world will be better than they are at present. It is, in one sense, a waste of good material to turn anthracite and coke into gas, losing all the heat attending the conversion, and blowing a considerable percentage into the air as well. The complete continuous gasification of soft slack in a closed vessel is the only proper object for designers of fuel gas processes.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. C. M. HOLMES, who has just purchased a controlling interest in the Santa Ana (Cal.) Gas Company, informs us that he will change the process of manufacture from coal to either water or crude petroleum gas. He invites correspondence in respect to the proposed change from the manufacturers of either type of apparatus named.

MR. WM. TRACY has resigned the management of the Peru (Ind.) American Gas Company, in order to assume the superintendency of the works and business of the Alton (Ills.) Gas and Electric Light Company. He expects to assume his new duties on or about July 1st.

It is with no little satisfaction that we say that the damage by the floods, which brought death and dismay to Pennsylvania, was not so bad to the gas interest at Williamsport as at first reported. Secretary and Treasurer Byers says that he will be able to light the city thoroughly within a fortnight. On the other hand, however, the plant at Johnstown was completely demolished. Even the main system is virtually a total loss.

SOMETHING over a week ago, as the result of a conference held in St. Louis, a combination of all the ammonia manufacturing companies working under the Clapp process was effected. The title of the consolidated enterprise is to be "The B. P. Clapp Ammonia Company," with the principal office at 245 Broadway, this city The members of the consolidated enterprise are the St. Louis Ammonia and Chemical Company, with factories in St. Louis and Cincinnati; the Washington Ammonia and Chemical Company, with works in Washington and New York, and the B. P. Clapp Company, of Rhode Island. The officers are: Geo. Shepard Page, President; W. A. Newman (St. Louis), Vice-President; Geo. G. Porter, Treasurer; C. W. Isbell, Secretary; B. P. Clapp (Pawtucket, R.I.), General Manager; W. E. Colville (Kansas City), Assistant Manager. The capital invested is $400,000, and a new factory is to be put up in Kansas City.

SOME of the merchants of Alameda are insisting that the City Trustees shall add an incandescent lighting plant to the arc specimen now being operated on municipal account. The agitators figure the cost of installation at $8,000. In the meantime we may remark that the average cost to the city (excluding all charges for interest and depreciation) of each arc light maintained is returned at 32½ cents per night. The arcs are of the usual 2,000-candle variety.

MR. EMERSON MCMILLIN'S election to the Presidency of the Consolidated Laclede Gas Company, of St. Louis, will not cause his complete retirement from the Columbus (O.) Company. He remains Vice-President and a Director of the latter, and is succeeded as General Manager thereof by his son-in-law, Mr. Irvin Butterworth. Messrs. Edward Dundon and Frank J. Thum each move up a step through the promotion of Mr. Butterworth.

MR. J. G. RICHEY, through purchase, has acquired control in the Plattsmouth (Neb.) Gas and Electric Light Company. The officers are: President, J. G. Richey; Secretary, C. D. Jones. It is the intention of the management to operate an electric annex, to be located on the Company's property at Sixth and Pearl streets. Mr. Richey being a wide-awake business man, it may be taken that Plattsmouth's lighting interests will not suffer while under his control.

GREEN ISLAND, N. Y., seems to be doomed to disappointment over its public lighting. It took several meetings of the Trustees and at least two village elections to negative the proposed electric lighting experiment, the final conclusion being to authorize the New York and New Jersey Globe Gas Light Company to put its lamps in the streets. The service was to have been inaugurated on the evening of last Tuesday, but as the train in which contractors had shipped the plant was stalled in the Johnstown flood, Green Island still remains in darkness.

FRANK RICHARDSON has been instructed by his Directors to apply to the Massachusetts Board of Gas Commissioners for permission to engage the North Adams Gas Company in the supply of electric lighting. If consent is granted, and there is no likelihood that such will be withheld, no time will be lost in making the installation.

AN interesting decision has been made in Montreal, Canada, by Judge Desnoyers, the case at issue being entitled Scriver *vs.* S. Fox. The complainant will no doubt be recognized by our readers as the Secretary of the Montreal Gas Company, the defendant being a tailor doing business on Notre Dame street. The charge was for having unlawfully used gas manufactured by plaintiff. Judge Desnoyers thus disposed of the case: "The law governing this action is found in the Statutes of United Canadas, X. and XI. Vic., chap. 79, sec. 18, and is: 'Be it enacted that if any person shall lay or cause to be laid any pipe or main to communicate with any pipe or main belonging to the said company, or in any way obtain or use its gas without the consent of the directors or their officer appointed to grant such consent, he, she or they shall forfeit and pay to the said company the sum of £25, and also a further sum of £1 for each day such pipe shall so remain, which said sum, together with the costs of suit in that behalf incurred, may be recovered by civil action in any court of competent civil jurisdiction.' The evidence shows that on March 20th, the defendant, a shopkeeper and gas consumer for some years back, being indebted in a certain amount for gas due and payable since the 14th of February previous, the Company sent to his place, No. 2,250 Notre Dame street, to turn off the gas at the meter in default of immediate payment. The defendant failing to pay the bill, the gas was turned off by means of a tight cork, introduced as is usually done in the pipe outside the meter. This was done by one of the officers of the Company in the presence of another officer, and was well done to my satisfaction, notwithstanding the attempt made to disprove the fact. On the afternoon of the same day, the defendant came to the office of the Gas Company, and, having paid his bill, asked the Company to let on the gas anew. This plaintiff was inclined to do, provided the defendant paid $1, being the emolument required in all such cases according to the charter and by-laws of the Company. The defendant refused to pay this dollar and left the office, stating that he would rather the Company should take away its meter than pay the additional sum; the Company by its officers then agreed to take away the meter, but did not agree to allow defendant to use its gas thereafter. Notwithstanding that the gas had been cut off, the defendant continued to use it as theretofore. On the 10th of April the Company was informed for the first time by its officer who is in the habit of taking statements of gas meters as to the quantity of gas consumed, that defendant so continued to use the gas. The defendant pretended that the plugging of the pipe must have been done imperfectly, as he never experienced any trouble in getting his supply of gas as formerly, after it had been cut off on the 20th of March, as aforesaid. The defendant has produced witnesses to establish this fact, but has not destroyed the evidence of the Company proving that the gas was really stopped on that day. Nothing in the evidence can show that the plugging was not well done; but there are circumstances to show that the cork was taken away by defendant himself. He had full opportunity to let on the gas himself, and he knew how easily it could be done, having twice before passed through the same experience under similar circumstances. By my direction, pending the trial, the gas meter in question was ripped open, and no cork was found inside of it, only a very small particle, such as might have fallen in when the cork was picked out with a knife, as is frequently done. The defendant was using the gas, in the name of F. Ship, since September, 1886, though he had previously used it in his own name, and is still indebted to the Company for gas consumed in the year 1886. So that upon the evidence I have no doubt at all but that the gas was turned off by the Company on the 20th of March last, and was let on again by the defendant himself, or by someone under his direction, without the knowledge of the Company. It must be remarked that the infraction here prosecuted is not for stealing the gas. I am satisfied that the defendant did not intend to steal it, but simply wanted to avoid paying the emolument of $1 claimed by the Company to let on the gas again. So I have not to deal with a case of larceny, but simply to ascertain if the gas was used without the consent of the Company. Not a word of proof is offered to show that the Company consented or even assented to the defendant resuming the use of its gas, and all the circumstances of the case show that it was not so willing. The penalty imposed ($100) is such a severe one that it caused me to hesitate, but being satisfied that this severity has been intentionally introduced in the law in order to protect the Company against those who might be disposed to use its gas clandestinely I hold it is my duty to

convict." Judgment was accordingly rendered for the Company in $100 and costs.

SUPT. CRAIG, of the Duluth (Minn.) Gas and Water Company, has 300 men at work on main extensions in that city. Most of the excavation has to be made through a formation of blue granite.

THE Cerrillos Water and Gas Company has been incorporated by Gov. Prince and Messrs. N. B. Laughlin and W. A. McKenzell, of Santa Fe, and S. W. Bonner, of Cerrillos, New Mexico. This place—it was not even on the maps for 1882—is on the Atchison, Topeka and Santa Fe Railroad, at a point some 20 miles south-southwest of Santa Fe, and is 40 miles north-northeast of Albuquerque. It has a population of perhaps 2,800 souls, is growing rapidly, and is one of the most beautiful spots on the American continent. The water works division of the enterprise will be attended to first.

THE proprietors of the Rockville (Conn.) Gas Light Company will install an electric lighting plant.

MESSRS. BROWN AND CLARK, who are floating about Central New York for the purpose of picking up charters for the operation of opposition gas plants, have had a very fair measure of success. Watertown and Oswego received them with open arms, and gave them off-hand all they asked for. It is supposed that capitalist Clark (of Detroit, Mich.) is interested in this movement. The charter at Watertown gives birth to the Union Light and Fuel Company, while the Oswego child has been baptized the Oswego Fuel and Illuminating Company. We have not the slightest idea that these speculators will ever do a bit of construction work in either of the places named.

THE City Fathers of Buffalo, N. Y., have adopted a resolution instructing their Committee on Lamps to inquire into the advisability of the operation by the city of a municipal lighting plant.

AT the annual meeting of the Georgetown (D. C.) Gas Light Company the following officers were chosen: President, John Leetch; Secretary, Geo. W. Cropley; Superintendent, J. D. Cathell; Directors, Thomas Knowles, J. H. Smoot, John Marbury, G. W. Cropley, W. B. Orme, W. F. Seymour, and S. Thomas Brown.

In all probability the present management at Troy, N. Y., will concentrate the manufacturing plant for the supply of gas to Troy, Waterford, and Lansingburgh at the uptown works of the old Citizens Gas Company. To effect this would require an expenditure of perhaps $55,000. Under the plans so far prepared the details include a branch track from the Fitchburgh Railroad, new coal sheds, increased generating capacity, and four purifying boxes. When these betterments are ready the old station of the Troy Gas Light Company, on Hill street, will be dismantled. Work for the new holder at Smith avenue is being vigorously pushed.

IN the charter granted by the Oswego (N. Y.) Council to the Oswego Fuel and Illuminating Company, it is stipulated that the maximum rate for an 18-candle gas shall be $1.50 per thousand cubic feet, provided bills are paid on or before the 10th day of the month; that the Company shall not "sell or dispose of, or transfer by consolidating or otherwise, its franchises or the rights and privileges hereby granted to any individual, corporation, company, or association, now or hereafter engaged in the business of manufacturing gas in the city of Oswego within a period of 10 years from the date of the passage of this resolution;" that the work of construction under the franchise will be under way on or before six months from the time of the grant, said work to be completed within one year from the acceptance of the grant. The same old rigmarole.

AT a meeting of the Village Trustees, Suspension Bridge, N. Y., it was resolved to grant a franchise to the Suspension Bridge Gas Light and Fuel Company, the right to be an exclusive one for a period of 5 years.

WILLIS HUNNICUT is a colored gentleman who had been employed as a fireman in the works of the Birmingham (Ala.) Gas and Electric Light Company. His temper is of the ragged sort, and he cannot accept calmly a rebuke for work poorly performed. A fortnight ago this colored gentleman was reproved by the foreman, whereupon he determined to have revenge. Between shifts he attempted to doctor the boiler-feed, but was detected in the act by the night engineer, who arrived at his post on the evening in question at an unusually early hour. Mr. Hunnicut is now in jail.

THE contract for the construction of the new gas plant at Dalton, Ga., calls for the payment of $35,000.

AT the annual meeting of the Willimantic (Conn.) Gas Company, the following officers were chosen: President, A. P. Sherman; Treasurer and Superintendent, J. H. Manchester; Secretary, C. H. Manchester; Directors, A. P. Sherman, R. S. Franklin, Jas. C. Swan, J. L. Hunter and Jno. H. Tilley.

THE Connecticut State Senate, in considering the resolution incorporating the Loomis Gas Machinery Company, of Hartford, evidently feared that it was the purpose of the organizers to establish gas companies in opposition to those now existing in the State. Although this was denied by the petitioners, who asserted that their sole purpose was to manufacture gas apparatus of the Loomis type for distribution or shipment in the ordinary practice existing between purchaser and seller, Senator Corbin thought it better to have the matter settled definitely. He thereupon offered the following amendment, which was adopted: "But no grant of power herein shall be construed to confer on said corporation any authority to engage in its own name, or in the name of any other person or corporation, in the business of making, distributing or selling any gas or electricity, or to acquire any right in any public street, square or place, or to operate any plant in any city, town or borough for such purposes."

ON May 31st the proprietors of the Marshalltown (Iowa) gas works resumed control of the property, the lease held by Mr. C. D. Shreve having terminated on the day mentioned. Mr. Frank Andres, who had been in Mr. Shreve's employ for the past 18 months, will act as superintendent. He is a clever, careful man, and did good service at the plant of the Council Bluffs Company for some years. On June 1st the change in management was signalized by the publication of a new rate schedule, the leading features of which are as follows:

Monthly Consumption.	Net rate per M.
The first 1,000 cu. ft.	$2.00
1,000 cu. ft. to 2,000 cu. ft.	1.90
2,000 " to 3,000 "	1.80
3,000 " and upwards	1.70

Gas supplied for cooking, heating and power purposes is to cost $1.50 per M. The prior gross rate was $2.70 per 1,000. In his letter informing us of these things Mr. Shreve writes: "My fortune being made, I expect to return to Sioux City and retire from the gas business for awhile, but will call around to see my old friend, Kellogg, and read his GAS LIGHT JOURNAL." While not wishing to curtail the vacation that Mr. Shreve has fairly earned, we nevertheless hope that he will soon be in the market after another gas works lease.

WE understand that it has been decided to take down the buildings on Lombardy place, now occupied as offices, etc., by the Citizens Gas Company, of Newark, N. J., so that the ground may be used as a site for a large gasholder. Other improvements are also in contemplation.

THE electric lighting plant of the New Bedford (Mass.) Gas Light Company is now safely housed in the new buildings on South Water street. The station is supplying current to 200 arc and 3,000 incandescent lamps, and is about as complete in its equipment as any other electric lighting station in the country.

AMONG those who have reason to remember the recent disastrous floods may be mentioned Supt. Adams, of the Richmond (Va.) City Gas Works. At that point the flood reached a height sufficient to extinguish the retort house fires, and for a time it looked as if Richmond was to be without light. By June 6, however, the retort house was in fairly good shape, and since then everything has been going along smoothly. The main system was not badly disturbed.

THE charter held by certain parties for the Equity Gas Light Company, under which the latter may operate in the Eastern District of the city of Brooklyn, still causes much disquiet to those already in the field, which is not to be wondered at when it is remembered how important a factor it might become were it eventually to drift into the hands of "strong parties." This Equity Company was organized in 1874, but no great effort was then or thereafter made to operate a works. In 1884 the Williamsburgh Company asked the Attorney General to institute an action to annul the charter on the plea of *non user*, but the State declined to interfere, urging that it would be against public policy to adjudge that the charter had lapsed. About ten days ago another effort was made to have the State set aside its opinion in respect to its "public policy" conclusions, but the argument was postponed. The matter will come

before Judge Pratt, in the Supreme Court, on Saturday next. Such charters are beyond doubt against public policy, in that their existence is a menace to capital legitimately and actively engaged in developing results in the field of commerce; although the State—in refusing to determine that the Equity charter had lapsed—in 1884 seemed to think that "public policy" was being served in keeping alive an instrument which, under the manipulation of speculators pure and simple, could be used as a whip to flay those who were actually and had been for years serving the public.

THE Welsbach Incandescent Gas Light Company, of Indiana, has been chartered. The Directors are Messrs. Theo. F. Rose, Abbott L. Johnson, Charles N. Wilcoxon and Geo. F. McCulloch, all of Muncie, at which place the home offices are to be located. It is capitalized in $500,000. This Company owns the entire control of the Welsbach patents for the State of Indiana, save Marion and Delaware counties, and its rights also extend to Montgomery, Shelby, Darke and Miami counties, in Ohio. This virtually means that in the natural gas district of Indiana and a part of Ohio a strong effort will be made to use the gas as it comes from the wells, as an illuminating agent. We understand that a right good measure of success has so far been obtained in this direction at Muncie, where quite a number of Welsbachs have been in use for some time.

THE Trustees of Mount Vernon, N. Y., after a protracted series of investigations—we believe they took something like two years to study the thing up—have at last awarded a contract for the public lighting to the East Chester Gas Light Company. Nor did they make a mistake, either; for the figure at which the latter agreed to undertake the work is not approached by any gas contractor similarly situated in this country. Under the terms of the agreement the town is to maintain at no time less than 136 lamps, which are to be equipped with 3-feet burners, and to be kept alight for 4,000 hours per annum, the candle power of the gas to be not less than 18, the payment therefor to be at the rate of $18 per lamp per annum. The contract is to last for 5 years. This is certainly cheap public lighting; for it is lower than the price paid in Brooklyn, N. Y.—the rate of consumption, number of hours and quality of gas being identical in both places—where many thousands of lamps are employed. Mr. Nettleton, Sr., therefore, must be looked upon as the champion cheap public lighting purveyor.

A SHORT time ago we published the invitation to bid on the public lighting of Dedham and Hyde Park (Mass.), extended by the town Trustees to the local gas and electric lighting company. In response to the invitation the Company submitted the following tenders: *First.*—The Company will supply gas for 100 gas lamps, each burning 4 feet per hour, and will light and extinguish said lamps; and will supply and light 52 arc lamps, each of 1,200-candle power, placed at such points, on a plan herewith submitted, as your Committee may indicate, on a circuit of not over 16 miles—the entire plant to be run 1,200 hours in the year, on a contract for 3 years, for the sum of $5,000 per year; or the Company will supply and light 100 gas lamps and 45 arc lights on the same terms and conditions, the same to be run 1,500 instead of 1,200 hours. *Second.*—The Company will supply an electric arc plant of 72 lamps, each of 1,200-candle power, on a circuit of not over 16 miles, and run the same 1,200 hours in the year; or a simular plant of 60 lamps to be run 1,500 hours in the year, on the same conditions and terms as above.

THE manufacturing plant of the Williamsport (Pa.) Gas Light Company is in shape for work, but the main system is so badly flooded that distribution is almost out of the question. Secretary Byers thinks that it will take a fortnight to free the pipes. Some of the consumers' meters are rather odd-looking wrecks.

THE Empire State Gas Improvement Company has been incorporated by Messrs. J. E. Hedges, W. H. DeHart and E. R. Ames. Its headquarters are at East Orange, N. J., and it proposes to supply light, heat and power.

MESSRS. MONTGOMERY & HOWARD have been awarded the contract for putting up the electric light station recently ordered by the Chelsea (Mass.) Gas Company. It is to be located on Auburn street.

THE Sioux City (Iowa) Gas Company submitted a proposition to the authorities under which it agreed to light the streets by means of arc lamps, to be paid for at the rate of $8.33 each per month, the lamps to remain in service from darkness to daybreak; the only condition being that a 5-year contract be granted. This Company now performs the lighting, and is paid under the existing agreement $15 per light per month for a midnight service. A sweeping reduction, surely.

MR. E. C. JONES has been appointed Superintendent of the North End station of the Boston Gas Company.

MR. ADAM WEBER is about ready to turn over to its owners (the New York Contract Company) the new gas plant at Decatur, Ala. The plant is on modern lines, and the bench work is on the Weber improved plan.

WASHINGTON, D. C., had a narrow escape about a fortnight ago from darkness. It is said that the waters of the Potomac river were at one time only 3 feet away from the furnaces of the gas works.

THE authorities of Hamilton, Ont., have recommended that the lighting of the city be performed by means of a mixed system of arc and incandescent electric lamps. It is estimated that 100 arcs and 500 incandescents (20-candle power each) will be equal to the task.

THE stock of the Tacoma (Wash.) Light and Water Company has been increased to $1,500,000 from $500,000.

THE authorities of New Haven (Conn.) have evidently decided that the naphtha street lamp "must go," since it has been ordered that whenever possible gas lamps are to be substituted for those of the naphtha sort.

ATLANTA, Ga., was in darkness on the night of June 7, because of the neglect of the contractors in charge of the work of constructing a sewer through Foundry street. They had stripped quite a section of the gas and water pipes, and when "knocking off" time arrived, the workmen abandoned their tools, leaving the unsupported lengths of water and gas pipes to the care of the watchman. About 9 P.M. one of the water mains parted at a joint, and the adjoining gas main (10-inch) soon gave way. Result—floods and no gas. The city will have to foot the bills.

THE following hints from the Kerr Murray Manufacturing Company explain themselves: "We are now erecting the apparatus recently furnished the New Albany (Ind.) Gas Light and Coke Company, consisting of the following: Retort house roof, horizontal boiler, cast iron retort house floor, exhauster, P. & A. condenser, multitubular condenser and tower washer, four 12 by 12 ft. purifying boxes, with 10-inch center-seal and connections and hydraulic lifting apparatus for raising and lowering covers, and a 6-ft. station meter. We have also furnished the Penn Yan (N. Y.) Gas Light Company with new benches, one of our new improved 6-inch steam-jet exhausters, hot tar scrubber, pipe condenser, tower washer, center-seal with connectionfs, etc. We are also to build the Huntsville (Ala.) Gas Light Company a single-lift holder, 68 ft. diameter, by 20 ft. in height."

THE Davenport (Iowa) Gas Light Company will at once double its water gas capacity by putting in a second Springer cupola.

Recent Patent Issues.

The following list of recent patents relating to the gas interests is specially reported by Franklin H. Hough, solicitor of American and foreign patents, 925 F street, N. W., Washington, D. C.

ISSUE OF JUNE 4, 1889.

404,404. Apparatus for Manufacturing Gas. J. W. Harrison, and F. Egner, St. Louis, Mo.
404,520. Apparatus for Manufacturing Gas. W. Clark, Phila., Pa.
404,527. Gas Generator, Compound Hydrocarbon. R. Ferguson, St. Paul, Minn.
404,606. Gas Washer. J. DeBrouwer, Bruges, Belgium.
404,783. Gas Burner, Device for automatically Operating. C. M. Rider Newark, N. J.
404,750. Apparatus for Manufacturing Gas. J. F. Toraya, Havana, Cuba.

ISSUE OF JUNE 11, 1889.

404,830. Gas Burner. W. F. Folmer, New York city.
404,886. Gas Generating Apparatus. W. G. Bedford, Phila., Pa.
405,051. Gas Furnace. E. P. Reichhelm, Jersey City, N. J.
405,126. Gas Lighting and Extinguishing Apparatus, Automatic. N. H. Shaw, Somerville, Mass.
405,139. Gas Burner, Heating. S. L. Weigand, Phila., Pa.

THE AMERICAN
GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,

PROPRIETORS.

EDITOR—Jos. R. Thomas, C.E.

ASST. EDITOR—T. J. Cunningham.

MANAGER—C. E. Sanderson.

PUBLISHED ON EACH MONDAY OF THE YEAR AT

No. 42 Pine Street, New York.

This is a recognized official organ of

LIGHT, HEAT, STEAM, WATER SUPPLY,

VENTILATION, SANITARY IMPROVEMENT,

AND GENERAL SCIENCE

TERMS:

SUBSCRIPTION—Three Dollars per annum, in advance. Single copies, 10 cents.

AGENTS.

NEW YORK.—AMERICAN NEWS CO., 39 and 41 Chambers Street.

PHILADELPHIA.—PRATT & CO., Corner Ninth and Arch Streets.

Germany.—B. WESTERMANN &CO., of New York.

MONDAY, JUNE 17, 1889.

The Market for Gas Securities.

The city gas share market was without animation last week, Consolidated having been neglected on the Exchange. The range, too, was downward, although this is not to be accounted for on any tangible ground. At noon to-day (Friday, June 14) 88⅛ is bid. The Mutual Company has declared a 2 per cent. dividend payable July 10th. We look for much higher prices on this security than those now ruling. Equitable is in some demand, although investors seem disinclined to go beyond the present bid rate.

Over in Brooklyn the feeling is buoyant, and it is a fact that so far this summer the situation is the reverse of that reported for years back. As a rule, it has been an easy task at this season for shrewd watchers of the market to pick up odd lots of Brooklyn shares at figures that were certain to yield a nice return with the advent of the winter season. It seems, however, that these chances are to be less frequent in the future. It is confidently predicted that the State will listen favorably this time to the argument to declare the charter of the Equity Gas Light Company—which never got beyond the paper stage—forfeited.

Some inquiry has been made for Yonkers (N. Y.) gas, seekers offering 112; but we hardly think this figure will prove sufficiently tempting to holders. The feature in the specialties on the exchange was Chicago Trust, which advanced to 62, reaction, however, soon driving the figure back to 60. Baltimore Consolidated is in somewhat better demand—45 to 45¼—and some well-informed brokers think that higher figures are to be made in that security.

The time for turning in old shares in the Troy (N. Y.) Company ends with to-morrow (Saturday), and the permanent organization by the new owners will likely be completed before July 1st.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks,

16 WALL ST., NEW YORK CITY.

JUNE 17.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	88⅛	—
Central	500,000	50	—	—
" Scrip	220,000	—	—	—
Equitable	4,000,000	100	125	—
" Bonds	1,000,000	—	113	115
Harlem, Bonds	170,000	—	—	—
Metropolitan, Bonds	658,000	—	116	118
Mutual	3,500,000	100	105	106
" Bonds	1,500,000	—	100	102
Municipal, Bonds	750,000		—	—
Northern		50	—	—
" Bonds	150,000	—	—	100
Yonkers		112	—	—
Richmond Co., S. I.	346,000	50	60	70
" Bonds	15,000	—	—	—
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	105	107
Citizens	1,200,000	20	67	70
" S. F. Bonds	320,000	1000	—	103
Fulton Municipal	3,000,000	100	125	128
" Bonds	300,000		—	106
Peoples	1,000,000	10	72	75
" Bonds (5's)	368,000	—	97	—
" " (6's)	94,000	—	100	—
Metropolitan	1,000,000	100	89	—
Nassau	1,000,000	25	111	—
" Ctfs	700,000	1000	100	103
Williamsburgh	1,000,000	50	120	123
" Bonds	1,000,000	—	109	112

Advertisers Index.

GAS ENGINEERS. Page

Jos. R. Thomas, New York City ... 812
Wm. Henry White, New York City ... 806
Wm. Mooney, New York City ... 812
William Gardner, Pittsburgh, Pa ... 812
Fred. Bredel, N. Y. City ... 811

CHEMISTS.

Durand Woodman, New York and Newark, N. J ... 802

PROCESSES.

National Gas-Light and Fuel Co., Chicago, Ills ... 806
Bartlett, Hayward & Co., Baltimore, Md ... 813
Wm. Henry White, N. Y. City ... 806
United Gas Improvement Co., Phila., Pa ... 805
Henry Pratt & Co., Chicago, Ill ... 814

GAS AND WATER PIPES.

Gloucester Iron Works, Phila., Pa ... 812
Mellert Foundry and Machine Co., Reading, Pa. (John Fox, Selling Agent, N. Y.) ... 812
Ohio Pipe Co., Columbus, Ohio ... 812
M. J. Drummond, New York City ... 812
R. D. Wood & Co., Phila., Pa ... 814
Warren Foundry & Machine Co., New York City ... 812
Donaldson Iron Co., Emaus, Pa ... 812
Dennis Long & Company, Louisville, Ky ... 812

GAS WORKS APPARATUS AND CONSTRUCTION.

James R. Floyd & Sons, New York City ... 815
T. F. Rowland, Greenpoint, L. I ... 815
Delly & Fowler, Phila., Pa ... 815
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 814
Stacey Mfg. Co., Cincinnati, Ohio ... 815
Bartlett, Hayward & Co., Baltimore, Md ... 813
Morris, Tasker & Co., Limited, Phila., Pa ... 802
Davis & Farnum Mfg. Co., Waltham, Mass ... 770
R. D. Wood & Co., Phila., Pa ... 814
Bouton Foundry Co., Chicago, Ills ... 815
Smith & Sayre Manufacturing Co., New York City ... 815
Fred. Bredel, N. Y. City ... 811
United Gas Improvement Co., Phila., Pa ... 805
Henry Pratt & Co., Chicago, Ill ... 814
National Gas Light and Fuel Co., Chicago, Ills ... 806

GASHOLDER TANKS.

W. C. Whyte, New York City ... 813
J. P. Whittier, Brooklyn, N. Y ... 802

RETORTS AND FIREBRICK.

J. H. Gautier & Co., Jersey City, N. J ... 810
B. Kreischer & Sons, New York City ... 810
Adam Weber, New York City ... 810
Laclede Fire Brick Works, St. Louis, Mo ... 810
Brooklyn Retort and Fire Brick Works, Brooklyn, N. Y ... 810
Borgner & O'Brien, Phila., Pa ... 810
James Gardner, Jr., Pittsburgh, Pa ... 810
Henry Maurer & Son, New York city ... 811
Chicago Retort and Fire Brick Co., Chicago, Ills ... 811
Baltimore Retort and Fire Brick Co., Baltimore ... 810
Oakhill Gas Retort and Fire Brick Co., St. Louis, Mo ... 810
Emil Lenz, New York City ... 810

REGENERATIVE FURNACES.

Bartlett, Hayward & Co., Baltimore, Md ... 813
Fred. Bredel, New York City ... 811
Chicago Retort and Firebrick Co., Chicago, Ills ... 811
Wm. Henry White, N. Y. City ... 806
J. H. Gautier & Co., Jersey City, N. J ... 802

SCRUBBERS AND CONDENSERS.

G. Shepard Page, New York City ... 804
R. D. Wood & Co., Phila., Pa ... 814

GAS GOVERNORS.

Connelly & Co., New York City ... 807
Fred. Bredel, N. Y. City ... 811
Friedrich Lux, London, England ... 807

SELF-SEALING MOUTHPIECE DOORS.

Smith & Sayre Mfg. Co., New York City ... 807

TAR AND CARBONIC ACID EXTRACTOR.

Geo. Shepard Page, N. Y. City ... 772

CEMENTS.

C. L. Gerould & Co., Brooklyn, N. Y ... 810

GAS ENRICHERS.

Standard Oil Co., Cleveland, Ohio ... 816

GAS METERS.

Harris, Griffin & Co., Phila., Pa ... 818
American Meter Co., New York and Philadelphia ... 819
The Goodwin Gas Stove and Meter Co., Philadelphia, Pa ... 819
Helme & McIlhenny, Phila., Pa ... 819
D. McDonald & Co. Albany, N. Y ... 819
Nathaniel Tufts, Boston, Mass ... 818
Maryland Meter and Manufacturing Co., Baltimore, Md. ... 786

EXHAUSTERS.

P. H. & F. M. Roots, Connersville, Ind ... 803
Smith & Sayre Manufacturing Co., New York City ... 815
Wilbraham Bros., Philadelphia, Pa ... 807
Connelly & Co., New York City ... 807

GAS COALS.

Penn Gas Coal Co., Phila., Pa ... 817
Perkins & Co., New York City ... 816
Newburgh Orrel Coal Co., Baltimore Md ... 817
Despard Coal Co., Baltimore, Md ... 817
Chesapeake and Ohio R.R. Coal Agency, N. Y. City ... 817
Westmoreland Coal Company, Phila., Pa ... 817
J. & W. Wood, New York City ... 816

CANNEL COALS.

Perkins & Co., New York City ... 816
J. & W. Wood, New York City ... 816

VALVES.

Ludlow Valve Manufacturing Co., Troy, N. Y ... 808
John McLean, New York City ... 808
Chapman Valve Manufacturing Co., Boston, Mass ... 808
R. D. Wood & Co., Phila., Pa ... 814

GAS ENGINES.

Schleicher, Schumm & Co., Phila., Pa ... 820
Clerk Gas Engine Co., Phila., Pa ... 808
Van Dusen Gas Engine Co., Cincinnati, Ohio ... 808

ENGINES AND BOILERS.

Jarvis Engineering Co., Boston, Mass ... 807
Ball Engine Co., Erie, Pa ... 802
Westinghouse Machine Co., Pittsburgh, Pa ... 803

GAS LAMPS.

G. Shepard Page, New York City ... 776
Standard Gas Lamp Co., Phila., Pa ... 803

PURIFIER SCREENS.

John Cabot, New York City ... 808
Geo. A. Mills, Baltimore, Md ... 808

GAS STOVES.

American Meter Co., New York and Philadelphia ... 809
The Goodwin Gas Stove and Meter Co., Phila. Pa ... 788

STREET LAMPS.

J. G. Miner, Morrisania, New York City ... 802
Bartlett Street Lamp Man'fg Co., New York City ... 802

BURNERS.

C. A. Gefrorer, Phila., Pa ... 816

STEAM BLOWER FOR BURNING BREESE.
H. E. Parson, New York City..... 808

PURIFYING MATERIAL.
Connelly & Co., New York City..... 807
Friedrich Lux, London, England..... 807
Edgewater Lime Works, Edgewater, N. J..... 802

COKE CRUSHER.
C. M. Keller, Columbus, Ind..... 817

ELECTRICAL APPARATUS.
Wm. Henry White, N. Y. City..... 806

BOOKS, ETC.
Goodwin's Directory of Gas Light Companies..... 811
King's Treatise..... 812
Scientific Books..... 818
Management of Small Gas Works..... 808
Gas vs. Electricity..... 810
Practical Electric Lighting..... 807
Electric Light Primer..... 807
American Gas Engineer and Superintendents' Handbook... 817
Digest of Gas Law..... 811

POSITION WANTED,
As Superintendent or Assistant.

An educated Mechanical Engineer, with six years' experience and two years in charge of gas works, wishes a position as Superintendent of small works or Assistant in large works. References exchanged. Address
732-1 "MECHANICAL ENGINEER," this Office.

POSITION WANTED
As Superintendent.

Have had large experience in the manufacture and distribution of gas, and in the construction of plants. Good references.
Address "SUPERINTENDENT," care this Journal.

FOR SALE
Cheap for Cash,
A Paying Gas Works
In the Vicinity of Philadelphia, Pa.
For full information address
731-tf P. O. Box 597, Philadelphia, Pa.

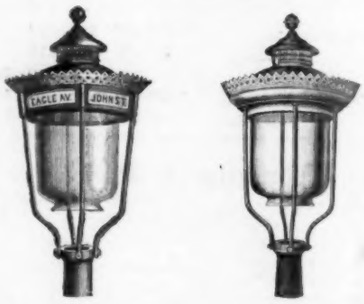
EDGEWATER LIME WORKS
Chas. F. McKenna, Proprietor.
SHELL LIME.
Lime by the Cargo for Gas Purification.
EDGEWATER, BERGEN CO., N. J.
Write for Testimonials and Prices.

FRIEDRICH LUX,
Ludwigshafen am Rhein and London.
Lux Mass
GAS GOVERNORS,
Gas Balance.

FOR SALE,
OR EXCHANGE FOR SMALLER ENGINE OR ENGINES.
25-H.P. Otto Gas Engine.
Good condition; improvements latest. Reason for selling, not large enough for my increasing business. Address
731-2t JNO. M. WOODSON, 919 Olive Street, St. Louis, Mo.

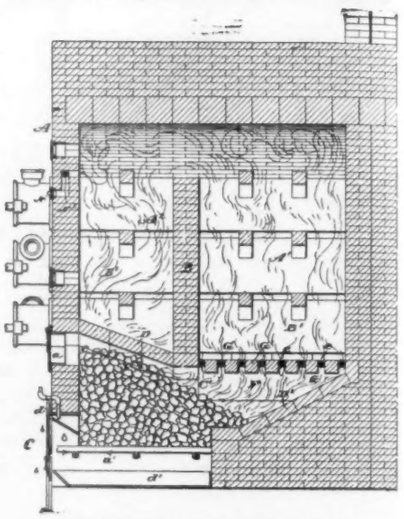
Bartlett Street Lamp Mfg. Co.

MANUFACTURERS OF
Globe Lamps,
FOR
Streets, Parks, Public Buildings, Railroad Stations, etc.
LAMP POSTS
A Specialty.
Office and Salesroom,
40 & 42 COLLEGE PLACE, - - N. Y. CITY.
Gas Companies and others intending to erect Lamps and Posts will do well to communicate with us.



The Miner Street Lamps.
Jacob G. Miner,
No. 823 Eagle Ave., New York, N. Y.

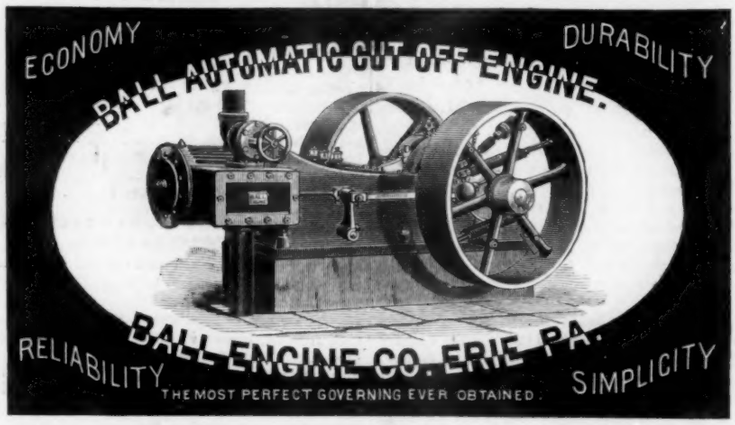
FLEMMING'S
Generator-Gas Furnace



Materials furnished and Benches erected by
J. H. GAUTIER & CO., - Jersey City, N. J.
Address as above, or D. D. FLEMMING, Jersey City, N. J.

MORRIS, TASKER & CO.,
Limited,
Builders of Gas Works,
PHILADELPHIA, PA.

DURAND WOODMAN, Ph.D.
Analytic and Technical
CHEMIST.
Analyses of Coals, Oils, Lubricants. Experimental Investigations for Inventors.
Laboratory, 494 Broad Street, Newark, N. J.
New York Office, (4 to 5 P.M.) **52 Broadway.**



Gasholder Tanks & Gas Works Masonry Complete.
PLANS PREPARED AND ESTIMATES FURNISHED AT SHORT NOTICE.
J. P. WHITTIER, - - 499 Wythe Av., Brooklyn, N. Y.

No. 29 Champion.

PHILADELPHIA. NEW YORK. CHICAGO.

STEPHEN A. MORSE, President. EDWIN F. MORSE, Secretary.
GODFREY REBMANN, Vice-Pres. CARLTON M. WILLIAMS, Treas.

STANDARD GAS LAMP CO.,

Main Office, 411 Cherry St. Factory, 1101, 1103, 1105 Frankford Av.

PHILADELPHIA, PA.

It is to the interest of Gas Companies and Cities to double the efficiency of the light on streets by using Dyott's Patent "CHAMPION" LAMPS. They save 50 per cent. over others in cost of repairs, are ornamental, and indestructible except by violence.

Our Patent System of Instantaneously Lighting Gas (without electricity), for Railroad Depots is unequaled.

Dyott's High Candle Power Burner is a very superior lamp where a concentrated and brilliant light is wanted in Hotels, Stores, Depots, etc.

Special Drawings furnished and Estimates cheerfully given, either from Architects', Engineers', or our Draughtmen's Plans.

We manufacture every description of Plain and Ornamental Lamps, Posts, Brackets, Clusters, etc. Correspondence solicited.

PATENTS.

FRANKLIN H. HOUGH

Solicitor of American & Foreign Patents.

925 F. ST., WASHINGTON, D. C.

(NEAR U. S. PATENT OFFICE.)

Personal attention given to the preparation and prosecution of applications for Letters Patent. All business before the U. S. Patent Office attended to for moderate fees. **No Agency in the United States possesses superior facilities for obtaining Patents,** or for ascertaining the patentability of inventions. Copies of patents furnished for 25 cents each. Correspondence solicited.

COMPOUND Condensing or Non-Condensing.
16 SIZES, 5 to 500 H. P.
Not yet equaled by any form of Engine for
HIGH FUEL DUTY AND SIMPLICITY.

STANDARD 13 Sizes in Stock. 5 to 250 H. P.
3000 in use in all parts of the Civilized World.

JUNIOR 6 Sizes in Stock, 5 to 30 H. P.
An Automatic Engine cheaper than a Slide Valve.
WELL BUILT. ECONOMICAL. RELIABLE.
Over 300 Sold the First Year.

All the above built strictly to Gauge with
INTERCHANGEABLE PARTS.
REPAIRS CARRIED IN STOCK.
SEND FOR ILLUSTRATED CATALOGUES.

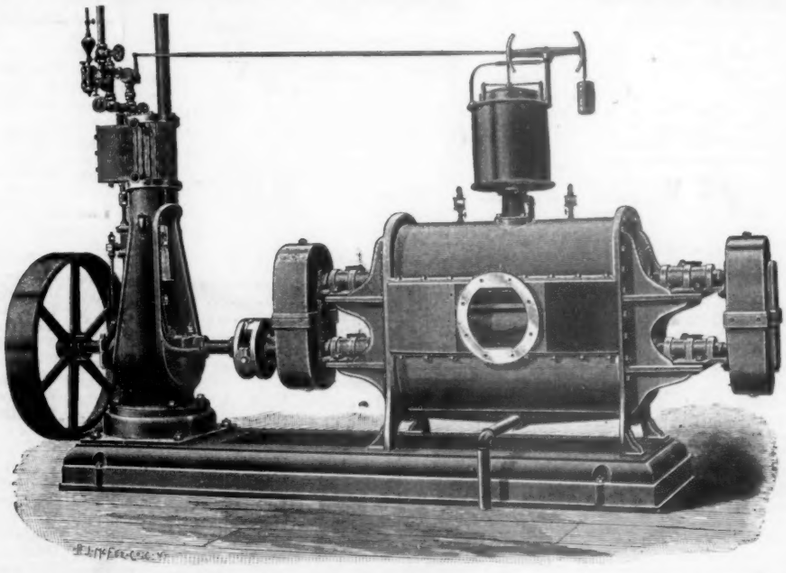
WESTINGHOUSE ENGINES

The Westinghouse Machine Co.
PITTSBURGH, PA. U.S.A.

SELLING DEPARTMENT IN THE UNITED STATES.

New York, Boston, Pittsburgh, Chicago,	47 Cortlandt St. Hathaway Building, Westinghouse Build'g, 156, 158 Lake St.	Westinghouse, Church, Kerr & Co.
Philadelphia,	608 Chestnut St.	M. R. Muckle, Jr. & Co.
St. Louis, Kansas City, Denver,	302, 304 Washington Av. 312 Union Avenue, 1330 Seventeenth St.	Fairbanks & Co.
Omaha,	1619 Capitol Avenue,	F. C. Ayer.
Pine Bluffs, Ark.		Geo. H. Dilley & Sons.
Salt Lake City, Butte, Mont.	259 S. Main St. n. Granite St.	Utah & Montana Machinery Co.
San Francisco, Portland, Or.	21, 23 Fremont Street, 33, 35 N. Front St.	Parke & Lacy Co. Parke & Lacy Mch. Co.
Charlotte, N. C. Atlanta, Ga.	36 College St. 45 S. Prior St.	The D. A. Tompkins Co.
Dallas, Tex. Chattanooga, Tenn.,		Keating Imp. & Machine Co. C. E. James & Co.

ROOTS' NEW GAS EXHAUSTER.



CONSTRUCTED ON ENTIRELY NEW PRINCIPLES.

THE ONLY EXHAUSTER MADE WHERE

The Parts Needing Attention are External, and Easily Accessible.

Send for Descriptive Catalogue and Price List.

P. H. & F. M. ROOTS, Patentees and Manufacturers, **CONNERSVILLE, IND.**

S. S. TOWNSEND, Gen. Agt., 22 Cortlandt St., N. Y. COOKE & CO., Selling Agts., 22 Cortlandt St., N. Y.

KIRKHAM, HULETT & CHANDLER, LIMITED.

PATENT "STANDARD" WASHER-SCRUBBERS

Erected and in course of construction at present date:

	Capacity. Cubic feet per day.
Altrincham	600,000
Adelaide	600,000
Aldershot	200,000
Allegheny, U. S. A.	1,000,000
Ashton-under-Lyne	1,250,000
Amsterdam	1,500,000
"	1,500,000
Annaberg	200,000
Arcachon	100,000
Animal Charcoal Co	200,000
Altoona, U.S.A.	350,000
Buxton	250,000
Bradford	1,000,000
"	1,250,000
"	1,250,000
"	1,250,000
"	1,000,000
"	1,000,000
"	3,000,000
Bremen	150,000
Baltimore, U.S.A.	1,000,000
"	1,000,000
"	1,000,000
Balmain, N.S.W	125,000
Bishops Stortford	150,000
Blackpool	400,000
Brussels	1,250,000
"	1,250,000
"	750,000
"	1,250,000
Banbury	250,000
Birmingham	5,000,000
Birkenhead	2,500,000
Blackburn	1,500,000
Bochum	600,000
Burntisland	250,000
Boston, U.S.A.	2,000,000
Brisbane	1,500,000
"	300,000
Burton-on-Trent	1,500,000
Barcelona	350,000
Barking	100,000
Baerlien & Co	20,000
"	20,000
Bombay	400,000
Buffalo, U.S.A., Mutual	750,000
" Citizen	500,000
Brookline, U.S.A.	500,000
Bergen	350,000
Berlin	1,250,000
Bournemouth	1,000,000
Bridgeport, U.S.A.	500,000
Brunswick	300,000
Beck & Co., St. Louis	100,000
Barmen Rittershausen	600,000
Bexhill	125,000
Brooklyn, U.S.A.	1,000,000
"	1,000,000
" Nassau	1,000,000
Brunner, Mond & Co.	400,000
Cheltenham	2,000,000
Cannes	200,000
Croydon	1,500,000
Copenhagen	200,000
Clevedon	200,000
Columbus, U.S.A.	500,000
Cincinnati, "	1,500,000
" "	1,500,000
Chicago "	3,000,000
" "	1,000,000
" "	1,000,000
Chemnitz	1,000,000
Crewe	1,250,000
Colonial Gas Works Co	100,000
Cadiz	300,000
Charlottenburg	600,000
Dudley	750,000
Driffield	100,000
Dukenfield	500,000
Dover	750,000
"	1,000,000
Deal	200,000
Derby	1,500,000

	Capacity. Cubic feet per day.
Dublin	3,000,000
Dowlais	100,000
Douai	500,000
Denton	500,000
Derby, U.S.A.	350,000
Denver, "	500,000
" "	1,000,000
Dusseldorf	750,000
"	500,000
Dumfries	250,000
Dunedin, N.Z.	400,000
Darlington	1,250,000
Detroit, U.S.A.	750,000
Edinburgh	1,500,000
"	2,000,000
Enfield	300,000
Essen	300,000
Elbing	150,000
Falmouth	150,000
Frankfort	300,000
Farnworth	400,000
Fenton	400,000
Friedenshutte	500,000
Furth	400,000
Freiburg	200,000
Goole	250,000
Glossop	300,000
Guildford	300,000
Gloucester	1,250,000
Gera	300,000
Grafton, N.S.W	100,000
Grieg	300,000
Georgetown, U.S.A.	250,000
Gluckauf	200,000
Heywood	600,000
Holywood	125,000
Huy	70,000
Harrow	250,000
Harrogate	250,000
Halstead	150,000
Heilbronn	200,000
Havana, Cuba	750,000
Hastings	1,500,000
Huddersfield	300,000
"	750,000
"	1,500,000
Hof	200,000
Hampton Wick	500,000
Heckmondwicke	500,000
Haverfordwest	100,000
Halifax, N.S.	350,000
Hamm	200,000
Halle	400,000
Heidelberg	300,000
Hartford, U.S.A.	1,000,000
Ilkeston	300,000
Inverness	250,000
Ilkley	200,000
Ilford	100,000
Kingston-on-Hull	400,000
Kidderminster	750,000
Kidsgrove	100,000
Konigberg	1,000,000
King's Lynn	300,000

LONDON:—

The Gaslight and Coke Co.:	
Beckton	1,250,000
"	1,250,000
"	1,250,000
"	1,250,000
"	1,250,000
"	2,500,000
"	2,500,000
Silvertown	1,000,000
Bromley	2,000,000
"	1,500,000
"	1,500,000
"	1,500,000
"	2,000,000
"	1,500,000

LONDON—*Continued.*	Capacity. Cubic feet per day.
Shoreditch	2,500,000
Pancras	1,500,000
"	1,500,000
Pimlico	2,000,000
Nine Elms	3,000,000
"	3,000,000
South Metropolitan Co:—	
Greenwich	3,000,000
Woolwich	400,000
Vauxhall	3,000,000
"	3,000,000
Lea Bridge	300,000
West Ham	1,500,000
Leeds	2,000,000
"	3,000,000
"	3,000,000
"	3,000,000
"	3,000,000
"	2,000,000
Leominster	150,000
Leiden	560,000
"	600,000
Liverpool	2,000,000
"	2,000,000
"	2,000,000
"	2,000,000
"	2,000,000
"	3,000,000
Lincoln	1,000,000
"	600,000
Lowell, U. S. A.	1,000,000
Louisville "	1,500,000
Long Eaton	500,000
Lilie	900,000
"	450,000
"	750,000
"	250,000
"	250,000
Luckenwalde	330,000
Liegwitz	300,000
Lincoln, U. S. A.	250,000
Lawrence "	500,000
Lynn "	300,000
Lyons	1,500,000
Maidstone	1,000,000
Marseilles	1,500,000
"	1,500,000
Mons	500,000
Malines	250,000
Melbourne	1,500,000
"	1,500,000
"	1,500,000
"	1,500,000
"	1,500,000
Manchester	2,500,000
Middleton	400,000
Manley, N. S. W.	100,000
Minneapolis, U. S. A.	750,000
Magdeburg	300,000
Memphis, U. S. A	750,000
Nottingham	1,250,000
"	2,500,000
"	2,500,000
"	2,000,000
"	1,500,000
"	2,000,000
Newport, U.S.A.	430,000
Newmarket	150,000
Newark, U.S.A.	680,000
Northfleet	200,000
New York, U.S.A.	2,000,000
Nice	600,000
Newcastle, N. S. W.	200,000
Numea, "	100,000
Namur	250,000
Newark	350,000
Oldbury	500,000
Otley	200,000
Oswestry	250,000

	Capacity. Cubic feet per day.
Ober Schlesian	1,500,000
Otto & Co.'s Coke Works	1,500,000
Plymouth	2,000,000
Parramatta, N. S. W.	100,000
Prescott	150,000
Providence, U.S.A.	750,000
"	750,000
Plauen	300,000
"	300,000
Portsmouth	2,500,000
"	2,500,000
Pittsburgh, U.S.A.	1,500,000
Portland, "	560,000
Pawtucket, "	500,000
Quebec	250,000
Radcliffe	750,000
Rouen	250,000
Ramsgate	1,000,000
Reigate	200,000
Richmond, U.S.A.	250,000
Roxbury, "	500,000
Runcorn Soap Co.	20,000
Rockhampton, N. S. W.	125,000
Richmond	1,500,000
Reading	2,000,000
Reichenbach	200,000
Salford	1,750,000
"	1,750,000
"	1,750,000
Smethwick	750,000
Sydney, N. S. W.	1,000,000
"	1,000,000
"	2,500,000
"	50,000
"	50,000
Sunderland	1,500,000
St. Josephs, U.S.A.	250,000
Spa	100,000
Sevenoaks	300,000
St. Petersburg	2,000,000
"	1,500,000
St. Louis, U.S.A.	2,000,000
"	2,000,000
"	1,000,000
Laclede	1,000,000
Silesian Coal Co.	600,000
San Francisco, U.S.A.	2,000,000
"	2,000,000
Sheepbridge Coal Co.	40,000
Stettin	200,000
Singapore	300,000
Sutton	500,000
Tonbridge	150,000
Tipton	400,000
Tottenham	1,000,000
Toledo, U.S.A.	750,000
Toronto	1,000,000
Uxbridge	300,000
Valparaiso	500,000
West Bromwich	1,000,000
Willenhall	250,000
Weston-super-Mare	500,000
Waltham	150,000
Wormwood Scrubs	300,000
Williamsburg, U.S.A.	600,000
"	600,000
Wellington	150,000
Warwick	300,000
Wheeling, U.S.A.	500,000
Walker	300,000
Westgate	100,000
Wilmington, U.S.A.	500,000
Windsor, N. S. W.	100,000
Wolverton	100,000
Wellington, N. Z.	250,000
Whitchurch	175,000
Washington, U.S.A.	2,000,000
Wallasey	750,000
Weimar	150,000
Wurzen	200,000
Worcester, U.S.A.	750,000
Yeadon	500,000
Yeovil	250,000

SOLE AGENT FOR WESTERN HEMISPHERE,

GEO. SHEPARD PAGE, 69 WALL STREET, NEW YORK.

UNITED

GAS IMPROVEMENT CO.

DREXEL BUILDING, CHESTNUT AND FIFTH STREETS,

PHILADELPHIA.

OFFICERS:

GEORGE PHILLER, President.
W. W. GIBBS, Vice-President.
SAM'L T. BODINE, Gen'l Manager.
H. H. EDGERTON, Chemist and Engineer.
EDWARD C. LEE, Sec'y and Treasurer.
ALEX. C. HUMPHREYS, Gen'l Supt.
WALTON CLARK, Ass't Gen'l Supt.
RANDAL MORGAN, Gen'l Counsel.

DIRECTORS:

GEORGE PHILLER,
WM. W. GIBBS,
THOMAS DOLAN,
JAMES A. WRIGHT,
HENRY C. GIBSON,
SAM'L T. BODINE,
S. A. CALDWELL,
WM. M. SINGERLY,
WM. T. CARTER.

BUILDERS, LESSEES AND PURCHASERS OF

GAS WORKS

Orders solicited from Large Cities, Small Towns, Mills, Institutions, from all who want More Light for Less Money.

PROCESSES. PROCESSES. ELECTRIC LIGHTING.

NATIONAL GAS LIGHT AND FUEL COMPANY,

No. 218 La Salle Street, Chicago.

THE SPRINGER SYSTEM

OF

Fuel and Illuminating Water Gas Works.

REFERENCES.

People's Gas Light and Coke Co.	Chicago, Ill.
Illinois Light, Heat and Power Co.	Chicago, Ill
Elgin National Watch Co.	Elgin, Ill.
C. R. I. & P. R. R. Shops	Chicago, Ill.
Decatur Gas Light and Coke Co.	Decatur, Ill.
Niles Gas Light Co.	Niles, Mich.
Newton Illuminating Co.	Newton, Kansas.
Wellington Light and Heat Co.	Wellington, Kansas.
Chippewa Falls Gas Light Co.	Chippewa Falls, Wis.
Elkhart Gas Light and Coke Co.	Elkhart, Ind.
Madison City Gas Light Co.	Madison, Wis.
South Bend Gas Light Co.	South Bend, Ind.
Sheboygan National Gas Co.	Sheboygan, Wis.
Salina Gas Light Co.	Salina, Kansas.
The Rathbun Co.	Deseronto, Prov. Ont.
Jefferson City Gas Light Co.	Jefferson City, Mo.
Mankato Gas Light Co.	Mankato, Minn.
Minneapolis Gas Light and Coke Co.	Minneapolis, Minn.
Lima Gas Light Co.	Lima, Ohio.
Bellevue Water and Fuel Gas Light Co.	Bellevue, Campbell County, Ky.
Bucyrus Gas Light and Fuel Co.	Bucyrus, Ohio.
Morris Gas Co.	Morris, Ill.
Los Angeles Gas Co.	Los Angeles, Cal.
San Diego Gas Fuel and Electric Lt. Co.	San Diego, Cal.
Sioux Falls Gas Co.	Sioux Falls, Dak.
Dakota Gas and Fuel Co.	Grand Forks, Dak.
St. Johns Mutual Gas Co.	St. Johns, Mich.
Stillwater Gas Light Co.	Stillwater, Minn.
St. Paul Gas Light Co.	St. Paul, Minn.
Emporia Electric and Gas Light Co.	Emporia, Kas.
Van Wert Gas Light Co.	Van Wert, Ohio.
Lansing Gas Light Co.	Lansing, Mich.
San Francisco Gas Light Co.	San Francisco, Cal.
Shelbyville Gas Light Co.	Shelbyville, Ind.
Great Falls Gas Light Co.	Great Falls, N. H.
Belleville Gas Co.	Belleville, Ontario.
Rochester Light and Fuel Co.	Rochester, Minn.
Northwestern Gas Light and Coke Co.	Evanston, Ill.
Lincoln Gas Light Co.	Lincoln, Neb.
Davenport Gas Light Co.	Davenport, Iowa.
Municipal Gas Co.	Albany, N. Y.
Alliance Gas Light Co.	Alliance, Ohio.
*Chicago Gas Light and Coke Co.	Chicago, Ill.
*New Gas Light Co.	Janesville, Wis.
*Joliet Gas Co.	Joliet, Ills.

* Building.

GUARANTEED ESTIMATES of Cost of Gas Furnished on Application.

WM. HENRY WHITE,

No. 32 Pine Street, - - - New York City.

ENGINEER AND CONTRACTOR FOR THE

Erection and Extension of Gas, Water, and Electric Light Works.

SOLE REPRESENTATIVE OF THE

McILHENNY REGENERATOR FURNACE PATENTS

And the Martin Water Gas Process.

Edison Incandescent and American Arc Electric Light Plants Installed.

Correspondence with Gas Companies contemplating extending or improving their Plants respectfully invited. Plans and Estimates Furnished.

To All Whom It May Concern!

The SIEMENS-LUNGREN COMPANY hereby warns the public against the use of various infringing Regenerative Gas Lamps which are offered for sale. This Company has heretofore delayed bringing suit to enjoin the manufacture or importation of such infringing lamps, solely because of the practical worthlessness of the infringing devices; and although, in each instance, they infringe some one or more of the various patents owned or controlled by this Company, they have fallen into disuse sooner than any suit could be brought to a hearing. As, however, the introduction of these infringing lamps has tended to discredit the practicability of our Company's system of regenerative gas lighting, we have instructed our Attorneys, Messrs. Geo. Harding, C. S. Whitman, and Silas W. Pettit, to give notice that legal proceedings will in future be taken against all such infringers

THE SIEMENS-LUNGREN CO., 21st St. & Washington Av., Phila., Pa.

CONNELLY & CO.,

SOLE MANUFACTURERS OF THEIR PATENTED SPECIALTIES.

"IRON SPONGE." Saves money, saves labor, and is the most efficient purifying agent ever offered as a substitute for lime. Now used *in every State in the Union*, and purifying daily over *thirty-five million cubic feet.* Should be used in every gas works. Its own saving will pay for it many times over.

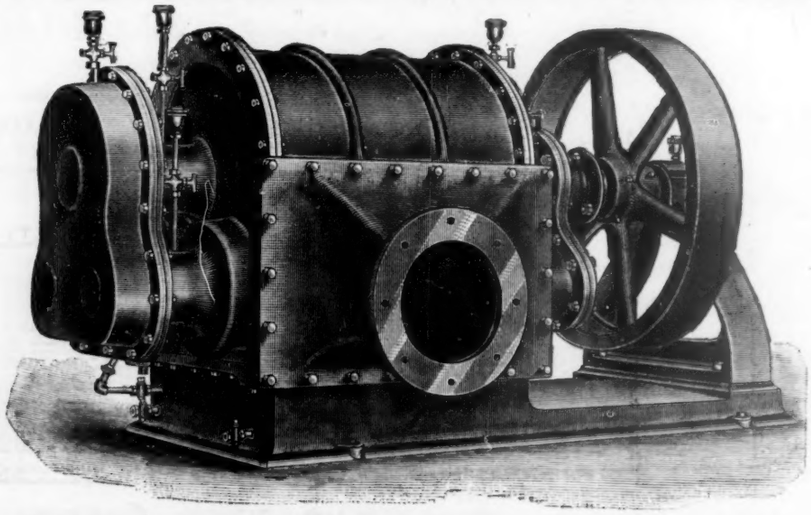
AUTOMATIC GOVERNOR. Has been on the market but *three years*, and in that time has been introduced *more generally* than any invention ever designed for use in gas works. Over *two hundred* of them now in use. Sensitive; reliable; perfectly automatic; reduces leakage; satisfies consumers, and gives great relief to the Manager. No gas works is *complete* without one of these machines.

STEAM JET EXHAUSTER. Designed particularly for small works Combines Exhaust Tube, Steam Governor Gas Compensator, and Bye-Pass Valves in the most compact form possible; occupies but little space; uses very little steam; operated by ordinary workmen; saves formation of carbon in retorts; increases yield 10 to 15 per cent. Specially adapted for *mixing air* with oil gas. *No works* too small to use them profitably.

Prices given on all our specialties *delivered at any point in the United States.* Correspondence solicited.

CONNELLY & CO., No. 177 Broadway, New York City.

WILBRAHAM GAS EXHAUSTER



WILBRAHAM BROS.,

PHILADELPHIA, PA.

JARVIS ENGINEERING CO.,

61 Oliver St., Boston, Mass.

CONTRACTORS FOR ERECTING

COMPLETE STEAM OUTFITS FOR ELECTRIC LIGHTING STATIONS.

Steel Boilers set with Jarvis Pat. Boiler Setting

To burn **COKE SCREENINGS** for Fuel.

ARMINGTON & SIMS CO. ENGINES,

Belting direct to Dynamos, without using Shafting.

SEND FOR CIRCULARS.

REFERENCES.—Charlestown Gas & Electric Light Co., Charlestown, Mass.; Schenectady Gas & Electric Light Co., Schenectady N. Y.; Brookline Gas Co., Brookline, Mass.

Practical Electric Lighting

By A. BROMLEY HOLMES, A.M.I.C.E.

With 87 Illustrations. Third Edition. **Price, $1.00.**

Electric Light Primer.

By CHARLES L. LEVEY.

A simple and comprehensive Digest of all the most important facts connected with the running of the Dynamo and Electric Lights, with Precautions for Safety, etc.

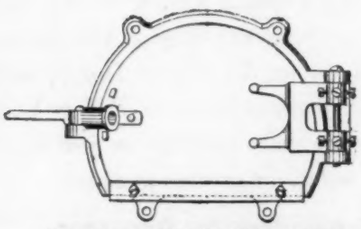
Price, 50 cents.

A. M. CALLENDER & CO., 42 Pine St., N.Y.

THE BRENNER SELF-SEALING RETORT DOOR.

Simple, Strong, and Durable.

CLOSES ABSOLUTELY TIGHT & IS LOCKED BY A CAM LEVER. ALL NECESSARY ADJUSTMENT FOR WEAR PROVIDED.



Brenner Self-Sealing Retort Door.

BUILT BY

SMITH & SAYRE MFG. CO.,

No. 245 Broadway, - - - - New York City.

WILLIAM B. LUNDIE, Superintendent of the 42d Street Station of the Consolidated Gas Company, of New York, writes, under date of Jan. 4, 1889:

"We have 320 Brenner Self-Sealing Lids in use at this Station, built by the Smith & Sayre Mfg. Co. They require very little attention, and are the best of the kind that I have seen, giving entire satisfaction."

CHAPMAN VALVE MANUFACTURING CO.,

MANUFACTURERS OF

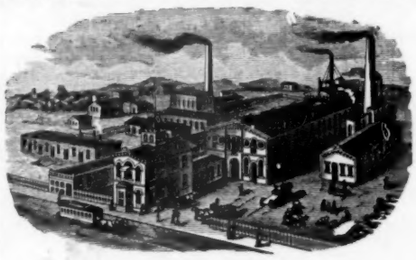
Valves and Gates for Gas, Ammonia, Water, Etc.

Also, Gate Fire Hydrants With and Without Independent Nozzle Valve. All Work Guaranteed.

WORKS & GEN'L OFFICE: Indian Orchard, Mass.

TREASURER'S OFFICE: 72 Kilby & 112 Milk Sts, Boston, Mass.

LUDLOW VALVE MFG. CO.



OFFICE AND WORKS,

938 to 954 River Street and 67 to 83 Vail Av., TROY, N. Y.

Hydraulic Main Dip Regulators, also Check Valves, Foot Valves, Yard-wash and Fire Hydrants. Send for Circulars.

Valves.—Double and Single Gate, ¾ in. to 48 in., outside and inside Screws. Indicator, etc., for Gas, Water, Steam, and Oil. Send for Circulars.

Parson's Steam Blower,

FOR IMPROVING BAD DRAUGHT IN BOILERS, AND FOR BURNING BREEZE OR OTHER WASTE MATERIAL.

PARSON'S TAR BURNER,

FOR UTILIZING COAL TAR AS FUEL.

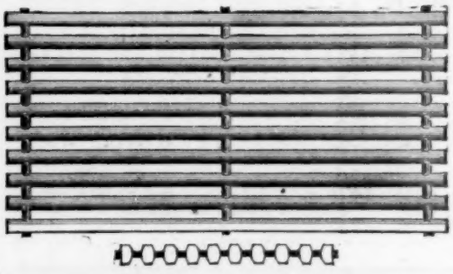
PARSON'S AIR JET TUBE CLEANER,

FOR CLEANING BOILER TUBES.

These devices are all first-class. They will be sent to any responsible party *for trial*. No sale unless satisfactory. Manufactured by the WATERTOWN STEAM BLOWER COMPANY.

H. E. PARSON, Supt., 33 & 35 Liberty St., N.Y

MILLS' REVERSIBLE LIME TRAY,



AND

WOODWORK

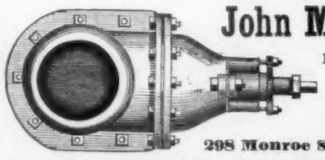
Of Every Description

NEEDED BY GAS WORKS.

SEND FOR CIRCULAR AND PRICE LIST TO

GEORGE A. MILLS,

No. 20 East Barre St., Baltimore, Md.



John McLean

Man'facturer

GAS VALVES.

298 Monroe Street, N. Y.

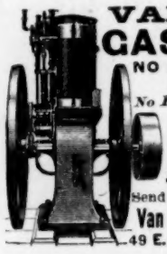
SPECIAL TRAYS FOR IRON SPONGE OR OXIDE OF IRON.

CHURCH'S TRAYS A SPECIALTY.

REVERSIBLE-STRONGEST-MOST DURABLE-MOST EASILY REPAIRED.

306-310 ELEVENTH AVENUE, NEW YORK.

WE ALSO MAKE THE CHEAPEST AND STRONGEST REVERSIBLE BOLTED TRAYS IN THE MARKET.



VAN DUZEN GAS ENGINE

NO BOILER. NO COAL. NO ENGINEER.

No Extra WATER RENT or INSURANCE.

INSTANTLY STARTED.

DURABLE, RELIABLE, SAFE and ECONOMICAL.

Send for description and prices.

Van Duzen Gas Engine CO.,

49 E. 2nd St., CINCINNATI, O.

The Management of Small Gas Works.

BY C. J. R. HUMPHREYS.

Price, $1.

Orders to be sent to **A. M. CALLENDER & CO.,** 42 PINE STREET, NEW YORK.

THE CLERK GAS ENGINE CO.,

Main Office, 1012, 1014, 1016, 1018 Filbert St., Philadelphia, Pa.

WM. W. GOODWIN, Prest. E. STEIN, Sec. S. LEWIS JONES, Asst. Sec. A. J. DOTY, Supt.

The utility and convenience of the Gas Engine being no longer an open question, it only remains now for intending purchasers to select the BEST. We claim for the CLERK GAS ENGINE that it is equal to any other manufactured as regards steadiness in running, simplicity, and ease of keeping in repair, and that it gives the greatest amount of power for the least money (both in first cost and expense of running) of any engine made. In support of this claim we refer to the test of the Gas Engines made under the direction of the American Institute of New York, in December, 1885, and heretofore published in these columns. These engines are especially adapted for continuous running under heavy loads, and we can refer to Engines which have run 22 hours a day for months at a time

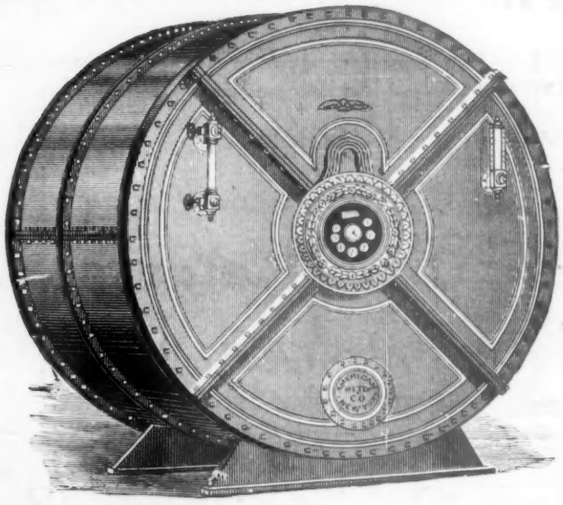
Made in Sizes of 5, 10, 15, 20, and 25 Horse Power. All Engines Guaranteed for One Year.

GAS STOVES. GAS METERS. GAS STOVES.

THE AMERICAN METER CO.,

MANUFACTURERS OF

GAS METERS AND GAS STOVES.



We would call the attention of Gas Engineers to the

PARKINSON THREE-PARTITION DRUM FOR STATION METERS.

This Drum insures an increased capacity of 25 per cent., and, in connection with Lloyd's Patent Stationary Shaft, the minimum of friction and consequent ease in working.

GAS COOKING STOVES.

The large number of our ECONOMY GAS COOKING STOVES AND RANGES in successful operation, and the continued demand for them, warrants us in asking our patrons to place their orders with us at as early a date as possible, in order to avoid delay in shipping.

MANUFACTORIES,

508 to 514 West Twenty-second St., N. Y. **Arch and Twenty-second St., Phila.**

Nos. 244 & 246 North Wells Street, Chicago, Ill.

AGENCIES,

No. 177 Elm Street, Cincinnati, Ohio. No. 222 Sutter Street, San Francisco, Cal.

No. 810 North Second Street, St. Louis, Mo.

GAS STOVE SHOW ROOMS, No. 242 Sixth Avenue, New York City.

RETORTS AND FIRE BRICK. RETORTS AND FIRE BRICK. RETORTS AND FIRE BRICK.

J. H. GAUTIER & CO.,
CORNER OF
GREENE AND ESSEX STREETS,
JERSEY CITY, N. J.
MANUFACTURERS OF
Clay Gas Retorts,
Gas House Tiles,
Fire Bricks, Etc. Etc.
Ground Clay, Fire Brick and Fire Sand in Barrels,
J. H. GAUTIER. C. E. GREGORY. C. E. GAUTIER.

BROOKLYN
Clay Retort & Fire Brick Works,
(EDWARD D. WHITE & CO.)
Manufacturers of Clay Retorts, Fire Brick, Gas House and other Tile.
VAN DYKE, ELIZABETH, RICHARDS & PARTITION STS.
Office, 88 Van Dyke St., Brooklyn, N. Y.

LACLEDE FIRE BRICK MFG. CO.,
MANUFACTURERS OF
Fire Brick, Gas Retorts,
AND
ST. LOUIS STANDARD SEWER PIPE.
Blast Furnace and Cupola Linings, every description of Fire Clay Material, Fire Clay Flue Linings, Chimney Tops Dry Milled and Crude Fire Clays, etc.
OFFICE AND DEPOT
901, 903, and 905 Pine Street,
ST. LOUIS, MO.

ESTABLISHED IN 1845.
B. KREISCHER & SONS,
OFFICE FOOT OF HOUSTON ST., E.R., N.Y.
Gas Retorts,
TILES, FIRE BRICK.
AND EVERYTHING IN THE FIRE CLAY LINE.

MANHATTAN
FIRE BRICK & ENAMELLED CLAY
RETORT WORKS
ADAM WEBER.
CLAY GAS RETORTS
AND RETORT SETTINGS
FIRE BRICKS, TILES, ETC.,
Office and Works, 15th Street and Avenue C., N. Y.

Works, LOCKPORT STATION, PA.
—ESTABLISHED 1864.—
JAMES GARDNER, JR.,
Successor to WILLIAM GARDNER & SON.
Office, Rooms 19 & 20, Lewis Block, PITTSBURGH, PA. P. O. Box 373.
Fire Clay Goods for Gas Works.
CHAS. H. SPRAGUE & SON, No. 70 KILBY STREET, BOSTON, MASS., Agents for the New England States.

2 & 4 Stone St., **EMIL LENZ,** New York City.
Clay Gas Retorts (Enameled), Fire Brick, Blocks, and Tiles.
MUNICH REGENERATIVE AND HALF-REGENERATIVE BENCHES.
Portland Cement, Fire Cement, Retort Enamel, Retort Cement, etc., etc. Correspondence Respectfully Solicited.

GEROULD'S IMPROVED RETORT CEMENT.
A Cement for patching retorts, putting on mouthpieces, and making up all bench-work joints. This Cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick. For recommendations and price list address
C. L. GEROULD & CO.,
5 & 7 Skillman St., Brooklyn, N. Y.
Western Agent, H. T. GEROULD, Mendota, Ill.

GAS vs. ELECTRIC LIGHT.
We would invite attention to the able and exhaustive argument of General A. Hickenlooper, President of the Cincinnati Gas Light and Coke Company, contained in a handsome pamphlet of 96 pages, entitled
"EDISON'S INCANDESCENT ELECTRIC LIGHTS FOR STREET ILLUMINATION. REPORT OF AN ARGUMENT DELIVERED BY A. HICKENLOOPER BEFORE THE COMMITTEE ON LIGHT, MUNICIPAL COUNCIL, CITY OF CINCINNATI, JULY 22, 1886."
This is a subject of special interest to all Gas Light Companies.
Prices.

25 copies.....	$7.50	100 copies.....	$22.50
50 copies.....	12.50	250 copies.....	50.00

A sample copy will be sent by mail on receipt of 50 cts.
A. M. CALLENDER, & CO., 42 PINE ST., N. Y. CITY.

Parker-Russell Mining and Mfg. Co.,
City Office: { American Central Building, Broadway & Locust, St. Louis, Mo.
PROPRIETORS OF THE
OAKHILL GAS RETORT & FIRE BRICK W'KS
Our immense establishment is now employed almost entirely in the manufacture of materials for
GAS COMPANIES.
We have studied and perfected three important points. Our retorts are made to stand changes of temperature, the strongest heats of the furnace, and the abrasion of feeding and emptying.
We furnish and build Half-Depth or Full REGENERATOR FURNACES of different kinds and most approved styles.
Correspondence solicited.

THOS. SMITH, Prest. AUGUST LAMBLA, Vice-Prest. & Supt.
BALTIMORE
RETORT & FIRE BRICK CO.
MANUFACTORY AT
LOCUST POINT, BALTIMORE, MD.
Clay Retorts, Blocks & Tiles,
FIRE BRICK, FIRE CLAY,
AND FIRE CEMENT.
Red and Buff Ornamental Tiles and Chimney Tops. Drain and Sewer Pipe (from 2 to 30 inches). Baker Oven Tiles 12x12x2 and 10x10x2.
WALDO BROS., 88 WATER ST., BOSTON, MASS.
Sole Agents the New England States.

HENRY MAURER & SON,

(ESTABLISHED 1856.)

EXCELSIOR FIRE BRICK & CLAY

RETORT WORKS

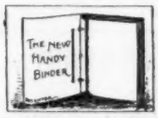
WORKS, Perth Amboy, N. J.

OFFICE, 418 to 422 East 23d St., N. Y.

Clay Gas Retorts,

BENCH SETTINGS,

Fire Brick, Tiles, Etc.



THE NEW HANDY BINDER.

This article may be described as elegant in appearance, strong, durable, and possessing many special qualities of its own. It allows the opening of the pages perfectly flat, whether one or several numbers are in the binder Any number can be taken out and replaced without disturbing the others. The papers are not mutilated for subsequent binding in permanent form. The binder is supplied with gilt side title, and is an ornament to any desk or reading table. The JOURNAL, filed in the Handy Binder, becomes a volume of great alue, always convenient for instant reference. **Handy Binder, Postage paid, $1.00.**

A. M. CALLENDER & CO., 42 Pine St., N. Y.

GREENOUGH'S "DIGEST OF GAS LAW."

Price, $5.00.

This is a valuable and important work, a copy of which should be in the possession of every gas company in the country, whether large or small. As a book of reference it will be found invaluable. It is the only work of the kind which has ever been published in this country, and is most complete. Handsomely bound. Orders may be sent to

A. M. CALLENDER & CO.,
42 Pine Street, N. Y.

FRED. BREDEL,

CONTRACTOR FOR THE COMPLETE

Erection and Equipment of Gas Works.

SOLE PROPRIETOR OF THE

KLOENNE PATENTS

FOR NORTH AMERICA.

REGENERATIVE FURNACES.

(900 Retorts are now fired in America by the Kloenne-Bredel System.)

SELF-SEALING MOUTHPIECES.

(Over 800 Now in Use.)

Standard Condensers. Washer-Scrubbers.

TAR WASHERS FOR WATER GAS PLANTS.

(In use in the works of the Chicago Gas Lt. Co.)

GASHOLDERS.

Bredel's Automatic Gas Governor.

Refers, by permission, to Mr. Eugene Vanderpool, Newark, N. J.; Mr E. G. Cowdery, Milwaukee, Wis.; and Mr. Theo. Forstall, Chicago, Ills. For further infomation, address

FRED. BREDEL,

No. 208 East Seventeenth Street, N. Y. City.

CHICAGO RETORT AND FIRE BRICK COMPANY,

GEO. C. HICKS. President. 45th, Clark and La Salle Streets, Chicago, Ill. CHAS. A. REED, Sec. & Treas.

Manufacturers of Standard Clay Retorts, Gas Works Tiles and Settings, Fire Bricks, Ground Fire Clay, Fire Mortar, Blocks for Locomotives, Cupolas, Boilers, Ovens, etc.

The Hicks Regenerative Furnace.

FOR LARGE OR SMALL GAS WORKS. NO ROASTING PITHOLE FOR THE STOKERS. NO EXCAVATION BELOW THE ORDINARY ASHPAN.

This Bench is applicable everywhere as a practical adaptation of the Regenerative and Recuperative System, giving, at a moderate cost, a very high efficiency, with great saving of labor and coke. Even with an isolated bench we guarantee a production of 42,000 ft. per bench of 6's, 14″×26″×9′, on 30 per cent. of coke, *hot* or *cold*, with probable production of 48,000 ft. if desired. We also construct the highly successful *Two-Story Regenerative Benches* on the plans of Mr. A. Arndt, Engineer of the Chicago Gas Light and Coke Co. Also, the *Sloping Retort System* of Henry Pratt, Engineer of the Peoples Gas Light and Coke Company, of Chicago.

Fire Clay Materials for Water Gas Cupolas, etc. Special Attention to Making Tiles and Blocks to Order.

Boston Agents, · · FISKE, COLEMAN & CO.

GOODWIN'S DIRECTORY

OF THE GAS LIGHT COMPANIES of the UNITED STATES & CANADA.

Price, · · · · · · · · $8.00.

Orders may be sent to

A. M. CALLENDER & CO., No. 42 Pine Street, N. Y. City.

GAS AND WATER PIPES. GAS AND WATER PIPES. ENGINEERS.

SAM'L R. SHIPLEY, Pres.
HENRY B. CHEW, Treas.

JAS. P. MICHELLON, Sec.
WM. SEXTON, Supt.

GLOUCESTER IRON WORKS,

GLOUCESTER CITY, N. J.

Cast Iron Gas & Water Pipes, Stop Valves, Fire Hydrants, Gasholders, &c.

Office, Rooms 61 and 63 Bullitt Building, 131 S. 4th St., Phila., Pa.

WARREN FOUNDRY AND MACHINE CO.,

Established 1856. Works at Phillipsburgh, N. J.

New York Office, 160 Broadway.

CAST IRON WATER AND GAS PIPE,

FROM TWO TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

Flange Pipe for Sugar House and Mine Work. Branches, Bends, Retorts, etc., etc.

DENNIS LONG & COMPANY,

LOUISVILLE, KY.,

Manufacture Exclusively

CAST IRON GAS & WATER PIPE & SPECIAL CASTINGS

OF ALL SIZES.

King's Treatise on Coal Gas.

A standard text-book for the Engineers and Managers of Gas Works, and for all who are concerned or take an interest in the manufacture and distribution of Coal Gas, and in the utilization of the Secondary Products resulting therefrom; treating also of the Gas Engine, and of Gas Cooking and Heating Appliances.

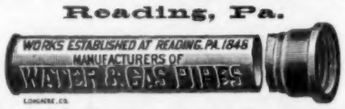
In 3 Vols. Price per Vol., $10. Sold either by Volume or in Sets.

A. M. CALLENDER & CO., 42 Pine St., N. Y.

P. D. WANNER, Chairman. A. H. MELLERT, Mangr. of Wks
R. B. KINSEY, Secretary. F. A. KNOPP, Treasurer.

MELLERT FOUNDRY & MACHINE CO., Ltd., and READING FOUNDRY CO., Ltd.,

Reading, Pa.



Specials—Flange Pipe, Valves and Hydrants
Lamp Posts, Retorts, etc.

General Foundry and Machine Work.

JOHN FOX, Selling Agent. 160 Broadway, N.Y.

THE OHIO PIPE COMPANY,

MANUFACTURERS OF

Cast Iron Gas & Water Pipe,

BRANCH AND SPECIAL CASTINGS.

Gas-House Bench Castings, Hydraulics, Lamp Posts, Flange Pipe and Specials, Architectural Castings, Building Columns, Joists, Cellar Grates, Sash Weights, etc.

GENERAL FOUNDERS AND MACHINISTS.

Columbus, Ohio.

M. J. DRUMMOND,

SPECIAL CASTINGS AND LAMP POSTS.

Sales Agent for the New Phila. Pipe Works Co.

Office, Equitable Building, 120 Broadway, N. Y.

EMAUS PIPE FOUNDRY.

DONALDSON IRON COMPANY. EMAUS, PA.

MANUFACTURERS OF

CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

JOS. R. THOMAS,

No. 42 Pine Street, N.Y. City.

CONSULTING AND CONSTRUCTING

Gas Engineer and Contractor.

PLANS, SPECIFICATIONS, AND ESTIMATES FURNISHED.

Contracts taken for all Appliances required at a Gas Works,

Either for New Works or Extensions to Old Plants.

WM. MOONEY

(Successor to WM. FARMER)

No. 94 Liberty St., N Y. City.

CONTRACTOR FOR THE ERECTION OF GAS WORKS, OR APPARATUS OF ANY CAPACITY. AGENT FOR WM. FARMER'S PATENTS.

Plans and Specifications Furnished.

WM. GARDNER,

Gas Engineer,

Lewis Block, Room 20, Pittsburgh, Pa.

Those who intend to make alterations in existing gas plants, or who contemplate the erection of new works, will find it to their interest to open correspondence with the above. Plans made and estimates furnished.

BARTLETT, HAYWARD & CO.

Baltimore, Md.

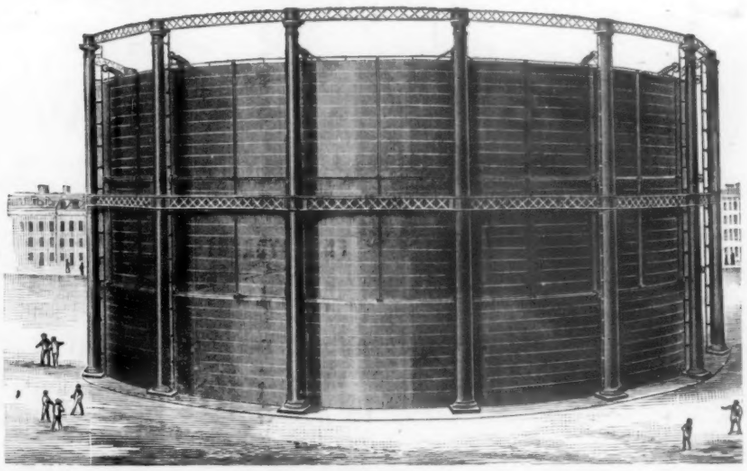
Triple Double, & Single-Lift
GASHOLDERS.

Iron Holder Tanks.

ROOF FRAMES.

Girders.

BEAMS.



PURIFIERS.

CONDENSERS.

Scrubbers.

BENCH CASTINGS.

OIL STORAGE TANKS.

Boilers.

The Wilkinson Water Gas Process.

THIRTY-CANDLE, NON-CONDENSABLE, FIXED GAS. THE MOST SUCCESSFUL GAS PROCESS IN OPERATION.

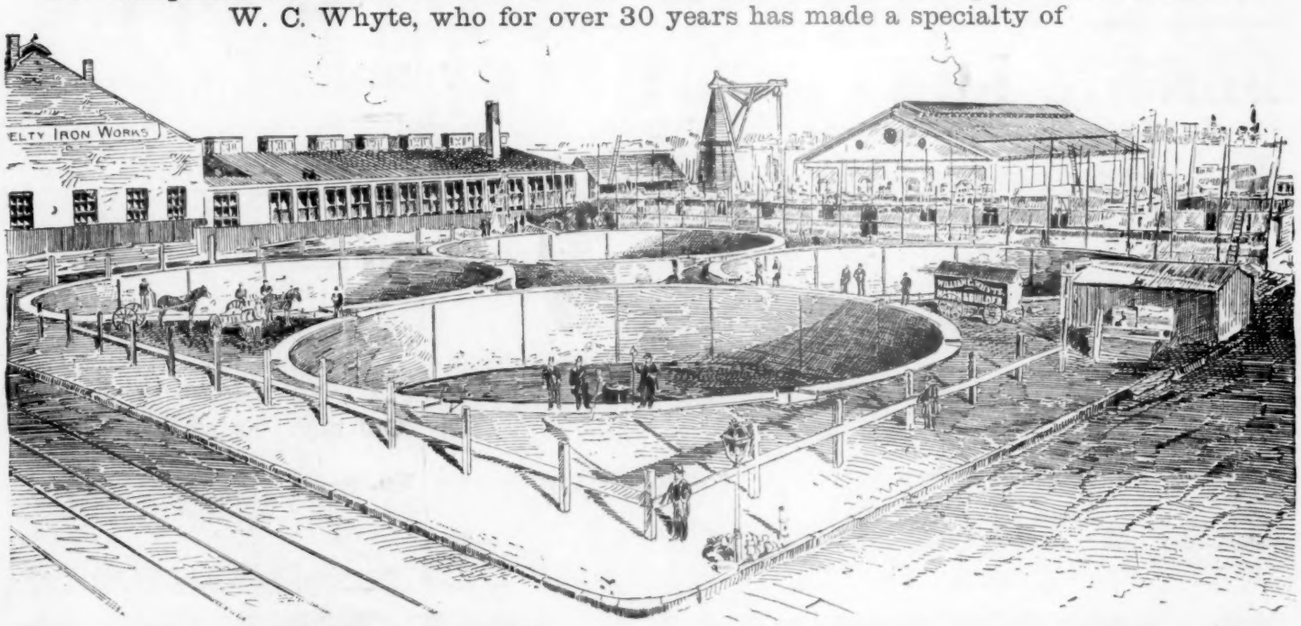
Munich Regenerative Furnace, System Drs. Schilling & Bunte.

HAZELTON BOILERS.

Gas Works Designed and Constructed.

GASHOLDER TANK CONSTRUCTION, ETC.

Gas Companies and others about to erect Gasholders will find it profitable to consult W. C. Whyte, who for over 30 years has made a specialty of



Tank Excavation and Mason Work.

Fifty Tanks now in operation show the sort of work done. Address

W. C. WHYTE, - No. 15 Cortlandt Street, N. Y. City.

GAS WORKS APPARATUS AND CONSTRUCTION. GAS WORKS APPARATUS AND CONSTRUCTION.

WORKS: { MILLVILLE, N. J. / FLORENCE, " / CAMDEN, "

R. D. WOOD & CO.,

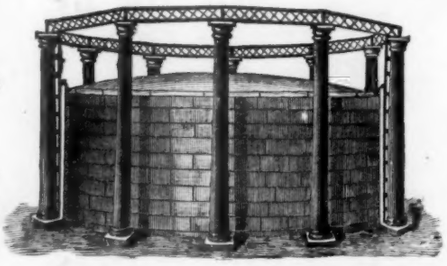
OFFICES: { 400 CHESTNUT ST., / PHILADELPHIA.

CAST-IRON PIPE 1½ to 72 Inches in Diameter.

Water Machinery and Gas Apparatus. HEAVY CASTINGS.

HOLDERS, PURIFIERS, FLOORS AND ROOFS,
LAMP POSTS, CONDENSERS, FLANGED PIPE,
VALVES, BENCH WORK, FIRE HYDRANTS,
METER CASES.

Estimates and Specifications for NEW WORKS or EXTENSIONS or ALTERATIONS of OLD ONES.



Plans and Estimates Furnished for New Works or for the Alteration of Old Works.

HENRY PRATT & CO.,

BUILDERS OF THE

PRATT & RYAN WATER GAS GENERATORS,

Arranged to Use Either Crude Oil or Naphtha.

Condensers, Scrubbers, Purifiers, and all Apparatus for Coal or Water Gas.

IRON ROOFS, BOILERS, TANKS, ETC.

Orders and Correspondence Solicited.

Office and Works, 869 to 875 So. Halsted St. CHICAGO, ILL.

KERR MURRAY MANUFACTURING CO.,

ENGINEERS AND CONTRACTORS FOR THE CONSTRUCTION OF

GAS WORKS APPARATUS.

Iron Roofs, Gutters, Retort House Floors, Bench Castings, Regenerator Furnace Castings, Rotary and Steam Jet Exhausters, Annular and Multitubular Condensers, Coil Pipe Condensers, Hot Tar Scrubbers, Tower & Rotary Washers, Purifiers, Center Seals, Patent Four-Way Valve Combination.

Hydraulic Lifts for Purifier Covers, Ash and Southern Pine Reversible Trays, Meter Bye-Passes, Hub and Flange Stop Valves, Lamp Posts, Wrought Iron Oil and Water Tanks, Coal Charging Wagons, Coke Dumping Barrows, Retort House Tools, Steam Engines and Boilers, Combination Pressure Gauges.

Single-Lift and Telescopic Gasholders.

STREET MAIN SPECIALS.

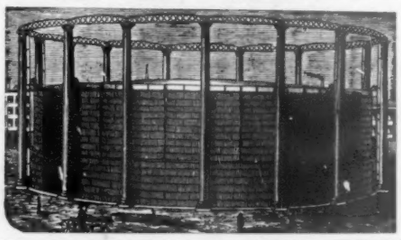
Plans, Specifications and Estimates for New or Rebuilding of Old Works furnished on application. Address all communications to

KERR MURRAY MANUFACTURING COMPANY, - FORT WAYNE, IND.

A. D. CRESSLER, General Manager.

GAS WORKS APPARATUS AND CONSTRUCTION. GAS WORKS APPARATUS AND CONSTRUCTION.

JAMES R. FLOYD & SONS,
(SUCCESSORS TO HERRING & FLOYD)
Oregon Iron Works,
W. 20th & 21st. Sts., bet. 10th & 11th Avs.,
NEW YORK CITY.
Engineers and Contractors
FOR THE
CONSTRUCTION OF GAS WORKS.
MANUFACTURERS OF
All Kinds of Castings and General Ironwork
FOR
GAS APPARATUS.
Bench Castings, Regenerative and Half Regenerative Furnace Castings.
Condensers, Scrubbers, Purifiers, Street Drips and Connections,
Valves,
Hydraulic Hoisting Purifier Carriage, Self-Sealing Retort Lids, Improved Valve Stand and Indicator, Seller's Cement.
Plans, Specifications, and Estimates furnished for Construction of New or Alteration of Old Works.

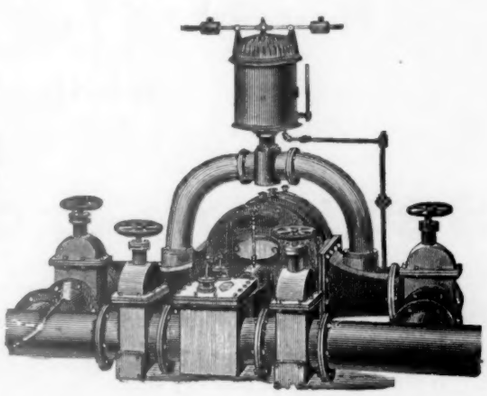
CONTINENTAL IRON WORKS.
THOS. F. ROWLAND, Prest. WARREN E. HILL and CHAS. H. CORBETT, V.-Prests. THOS. F. ROWLAND, JR., Sec. & Treas.

P. O. Station G., BROOKLYN, N. Y.
ENGINEERS AND MANUFACTURERS OF
Gas Holders
CONDENSERS, SCRUBBERS, VALVES,
PURIFIERS, SELF-SEALING RETORT LIDS
Hydraulic Mains,
And all other articles connected with the manufacture and distribution of Gas.

H. RANSHAW, Prest. & Mangr. WM. STACEY, Vice-Prest. T. H. BIRCH, Asst. Mangr. R. J. TARVIN, Sec. & Treas.
STACEY MFG. CO.,
MANUFACTURERS OF
Single and Telescopic Gasholders,
IRON ROOFS, BRIDGES, LAMP POSTS,
Water and Oil Tanks, Coal Elevator Cars,
COKE CRUSHERS, BENCH CASTINGS,
And all kinds of Wrought and Cast Iron Work used in the erection of Coal and Oil Gas Works Rolling Mill Machinery and Heavy Castings a Specialty.
Foundry: 33, 35, 37 & 39 Mill Street. Wrought Iron Works: 16, 18, 20, 22, 24 & 26 Ramsey Street.
Cincinnati, Ohio.

Bouton Foundry Co.,
FOUNDERS AND MACHINISTS,
CHICAGO, ILL.
Gas Works Apparatus,
PURIFIERS, CONDENSERS,
Bench Work,
SPECIALS, LAMP POSTS,
SCRUBBERS,
Iron Roofs and Floors.
Plans and Estimates furnished for new works or extensions of old works.

1842. DEILY & FOWLER, 1889.
Laurel Iron Works.
Address, No. 39 Laurel Street, Philadelphia, Pa.
BUILDERS OF
GASHOLDERS,
Single and Telescopic.
Holders Built 1884 to 1888, Inclusive:

Newport, R. I.	Long Island City, N. Y	Port Chester, N. Y.	Malden, Mass.	West Chester, Pa. (2d
Portland, Oregon.	Macon, Ga.	New Rochelle, N. Y.	Paducah, Ky.	Lancaster, Pa. (3d)
Allegheny, Pa. (2d.)	York, Pa.	Salem, N. J. (3d)	Norwich, Conn.	Tacony, Pa. (two)
Atlanta, Ga. (2d.)	Chester, Pa.	Omaha, Neb. (2d)	Seattle, W. T.	Mount Vernon, N. Y.
N.Y.City (Central Gas Co)	Hazleton, Pa. (2d.)	Lynn, Mass. (2d)	San Diego, Cal.	Binghamton, N. Y.
Lynchburg, Va. (2d.)	Staten Island, N. Y.	Little Rock, Ark.	Northern Gas Lt. Co., of	Concord, N. H.
Saylesville, R. I.	Saugerties, N. Y.	Irvington, N. Y.	New York, N. Y.	Dover, Del. (2d)
Rondout, N. Y.	Clinton, Mass. (Lan. Mills)	South Boston, Mass.	Westerly, R. I.	Calais, Me.
Atlantic City, N. J	Chattanooga, Tenn.	Rye, N. Y. (2)	Willimantic, Conn.	New London, Conn. (2d)
Augusta, Ga.	Galveston, Texas. (3d.)	Woodstock, Ont.	Montclair, N. J.	West Chester, N. Y.
Waltham, Mass. (2)	Omaha, Neb.	Malden, Mass.	Attleboro, Mass.	Bay Shore, L. I.
Mahanoy City, Pa.	Fort Plain, N. Y.	Staten Island, N. Y. (2d)	Santa Cruz, Cal.	Washington, D. C.
New Castle, Pa.	Brunswick, Ga.	Woodstock, Ont.	Erie, Pa. (2d)	

SMITH & SAYRE MFG. COMPANY,
G. PORTER, Prest. *245 Broadway, N. Y.* CHAS. W. ISBELL, Sec'y.
Machinery & Apparatus for Gas Works
Drawings, Plans, and Estimates Furnished for the Improvement, Extension, or Alteration of Gas Works, or for the Construction of New Works.
Mackenzie's Patent Rotary and Steam Jet Gas Exhausters, Governors, Compensators, Condensers, Washers, Scrubbers. Isbell's Patent Automatic Street Pressure Governor, Gas and Water Valves, Hydraulic Main Dip Regulator, Bench Castings, etc. Purifying Boxes and "Standard" Scrubbers. Isbell's Patent Self-Sealing Retort Doors.


GAS COALS. CANNEL COALS. GAS ENRICHERS.

JAMES D. PERKINS. **PERKINS & CO.,** F. SEAVERNS.

General Sales Agents for

The Youghiogheny River Coal Company's

OCEAN MINE YOUGHIOGHENY GAS COAL.

The Coal from the Ocean Mine (recently operated by *Messrs. W. L. Scott & Co.*, of Erie, Pa.,) is now used by all the leading Gas Companies in the United States from Maine to Texas, and is recognized as *the only reliable Youghiogheny Gas Coal.* (See Map on p. 87 of this Journal, Feb. 16, '85.)

P. O Box 3695, New York. **PERKINS & CO., 228 and 229 N Y. Produce Exchange.** BEAVER STREET ENTRANCE.

BRECKENRIDGE CANNEL,

OF KENTUCKY.

This Colliery was re-opened in June, 1886, since which date the Cannel has been delivered to over sixty of the leading Gas Companies in this country and in Europe. As an enricher ONE TON of this Cannel will do the work of TWO TONS of any other available Cannel, and is more economical than Naptha or Oil of any character. It can be delivered in parcels of one car load or more to any point in the United States or Canada.

(See AMERICAN GAS LIGHT JOURNAL, June 16, '86, pp. 346–7.)

P. O. Box 3695, New York. **PERKINS & CO., 228 and 229 N. Y. Produce Exchange** BEAVER STREET ENTRANCE.

JELLICO GAS CANNEL,

FROM TENNESSEE.

This Colliery, operated by the Standard Coal and Coke Company, of Knoxville, Tenn., is now in full operation, and orders can be filled without delay. Situated directly on Railroad, shipments can be made to any point in the United States. The attention of Southern Gas Companies is called to the fact that this Cannel is the most accessible to them of any Cannel in the States. See Map in AMERICAN GAS LIGHT JOURNAL, Feb. 16, 1888.

P. O, BOX 3695, New York. **PERKINS & CO., 228 and 229 N. Y. Produce Exchange.** BEAVER STREET ENTRANCE.

JAMES & WILLIAM WOOD,

Gas and Cannel Coal Contractors,

No. 40 St. Enoch Sq., Glasgow. No. 2 Talbot Court, London.

Proprietors of the **BATHVILLE COLLIERIES** (which produce the celebrated **BOGHEAD CANNEL**), Shields, Shieldmuir, Drumpeller, and other Collieries. This Firm offer

STANDARD CANNELS,

Unequaled as Gas Enrichers.

Also, WEST FAIRMONT GAS COAL, of W. Va.

Analyses, prices, and all further information furnished on application to

Agency for U. S., Room 93, Nos. 2 & 4 Stone St., N.Y. City.

The Standard Oil Company,

REFINERS OF

NAPTHA AND GASOLINES.

ALSO MANUFACTURERS OF

A Special Grade of Naptha for Gas Companies

FOR ENRICHING COAL GAS.

Correspondence solicited.

No. 43 Euclid Avenue, Cleveland, Ohio.

To Gas Companies.

We make to order **CAP BURNERS** to burn any amount under a stated pressure. Send for samples.

Also, SERVICE CLEANERS, DRIP PUMPS, and STREET MAIN PROVING APPARATUS.

C. A. GEFRORER,

248 N. 8th Street, Phila.

COKE CRUSHERS. GAS COALS. GAS COALS.

Newburgh Orrel Coal and Coke Co.

MINERS AND SHIPPERS OF

STEAM, SMITHING, AND GAS COALS,

Foundry and Crushed Coke.

Home Office, 33 S. Gay Street, Baltimore, Md.

CHAS. MACKALL, Gen. Mangr.

CHAS. W. HAYS, Agent, No. 1 Broadway, N. Y.

Shipping Wharves, Locust Point, Baltimore.

The Despard Gas Coal Co.,

MINERS AND SHIPPERS OF

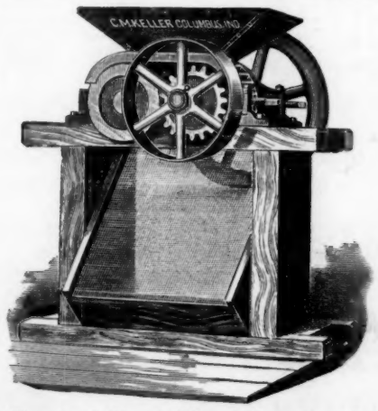
DESPARD GAS COAL,

AND MANUFACTURERS OF

COKE.

MINES, Clarksburg, Harrison Co., W. Va.
WHARVES, Locust Point, Baltimore, Md.
OFFICE, 225 E. German St., " "

ROUSSEL & HICKS, 71 Broadway, N. Y. } *AGENTS.* { BANGS & HORTON, 60 Congress St., Boston.



Keller's Adjustable Coke Crusher.

SIMPLE, STRONG, AND DURABLE.

C. M. Keller, Sec. & Supt. Gas Lt. & Coke Co. Columbus, Ind.

Correspondence Solicited.

King's Treatise on Coal Gas.

The most complete work on Coal Gas ever published.

Three Vols. Bound, $30.

BOOKS.

DISTILLATION OF COAL TAR AND AMMONIACAL LIQUOR.

By GEORGE LUNGE. Price $12.50.

A TREATISE ON THE COMPARATIVE COMMERCIAL VALUES OF GAS COALS AND CANNELS.

By DAVID A. GRAHAM. 8vo., Cloth. Price $3.

Orders for these books may be sent to this office.

A. M. CALLENDER & CO.,
42 PINE ST., N. Y. CITY

THE PENN GAS COAL CO.

OFFER THEIR

Coal, Carefully Screened & Prepared for Gas Purposes.

Their Property is located in the Youghiogheny Coal Basin, near Irwin and Penn Stations on the Pennsylvania Railroad, and on the Youghiogheny River.

Principal Office:

209 SOUTH THIRD STREET, PHILA., PA.

Points of Shipment:

Pennsylvania Railroad Piers; Greenwich Wharves, Delaware River; Pier No. 1 (Lower Side), South Amboy, N. J.

Chesapeake & Ohio Railway Coal Agency,

FOR THE SALE OF THE

Superior Kanawha Gas Coals, Cannelton Cannel,

Also, SPLINT AND STEAM COALS,

From the Kanawha and New River Regions, on the line of the Chesapeake & Ohio R'way.

C. B. ORCUTT, General Agent, - - No. 1 Broadway (Room 217) New York City.

FRANCIS H. JACKSON, Prest. EDMUND H. MCCULLOUGH, V.-Prest. CHAS. F. GODSHALL, Treas. H. C. ADAMS, Sec.

THE WESTMORELAND COAL CO.

Chartered 1854.

Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Penn.

POINTS OF SHIPMENT:

PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J.,
WATKINS (SENECA LAKE), N. Y.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

Principal Office, 224 South 3d St., Phila., Pa.

The American Gas Engineer and Superintendent's Handbook.

By WILLIAM MOONEY.

Consisting of Rules, Reference Tables, and Original Matter Pertaining to the Manufacture, Manipulation, and Distribution of Illuminating Gas.

350 Pages, Full Gilt Morroco. Price, by Mail, $3.00.

A. M. CALLENDER & CO., 42 Pine St., N. Y.

GAS METERS. GAS METERS. GAS METERS.

INTERNATIONAL--1876--EXHIBITION.

The U. S. Centennial Commission

HAVE DECREED AN AWARD TO

HARRIS, GRIFFIN & CO.,

Twelfth and Brown Streets Philadelphia Pa. No. 52 Dey Street, N. Y. City, and No. 75 North Clinton Street, Chicago, Ill.

FOR THE FOLLOWING REASONS:

The Exhibit consists of a Series of METERS from the Largest Size Station Meters for the use of the MANUFACTURE OF GAS, to those for the use of the ORDINARY CONSUMER. The Instruments are WELL MADE, RELIABLE as to INDICATION, and embody a number of sundry improvements which, with the general character of the Exhibit, entitle the whole to commendation.

Attest—J. L. CAMPBELL, Secretary, pro-tem. Signed—A. T. GOSHORN, Director General J. R. HAWLEY, President

Dry Gas Meters.

With 40 years' experience and the best facilities for manufacturing, is enabled to furnish reliable work and answer orders promptly.

NATHANIEL TUFTS,

No. 153 Franklin Street, Boston, Mass.,

MANUFACTURER OF

DRY GAS METERS.

Station Meters of any Capacity.

Test and Experimental Meters, Pressure Registers, Pressure Gauges, Pressure and Vacuum Gauges.

METER PROVERS, PHOTOMETERS, STREET LANTERNS, ETC., ETC.

Patent Cluster Lanterns for Street Illumination.

SCIENTIFIC BOOKS.

We are prepared to furnish to Gas Managers, and others interested in the topics treated of, the following books, at prices named:

KING'S TREATISE ON THE MANUFACTURE OF COAL GAS. Three vols; $10 per vol.

GAS MANUFACTURE, by WILLIAM RICHARDS. 4to., with numerous Engravings and Plates, in Cloth binding. $12.

TECHNICAL GAS ANALYSIS. $3.00.

GAS CONSUMER'S GUIDE. $1.

A GUIDE TO GAS LIGHTING. 40 cents.

GAS MEASUREMENT AND GAS METER TESTING, by F. W. HARTLEY. $1.60.

GAS CONSUMER'S HANDBOOK, by WILLIAM RICHARDS, C. E.; 18mo., Sewed. 20 cents.

A PRACTICAL TREATISE ON GAS AND VENTILATION, with Special Relation to Illuminating, Heating, and Cooking by Gas, by E. E. PERKINS. $1.25.

PRACTICAL TREATISE ON HEAT, by THOMAS BOX. Second edition. $5.

GAS WORKS—THEIR ARRANGEMENT, CONSTRUCTION, PLANT, AND MACHINERY. $8.

COAL; ITS HISTORY AND USE, by PROF. THORPE. $3.50.

THE GAS WORKS OF LONDON, by COLBURN. 60 cents.

THE GAS FITTER'S GUIDE, Showing the Principles and Practice of Lighting with Coal Gas, by JOHN ELDREDGE. 40 cents.

GAS WORKS, AND MANUFACTURING COAL GAS, HUGHES. $2.20.

THE MANAGEMENT OF SMALL GAS WORKS, by C. J. R. HUMPHREYS. $1.

MANUAL FOR GAS ENGINEERING STUDENTS, by D. LEE. 40 cents.

HOW TO MANAGE GAS, by F. WILKINS. Paper. 20 cents.

THE DOMESTIC USES OF COAL GAS, AS APPLIED TO LIGHTING, by W. SUGG. $1.40.

DISTILLATION OF COAL TAR AND AMMONIACAL LIQUOR, by GEO. LUNGE. New Edition. $12.50.

A TREATISE ON THE COMPARATIVE COMMERCIAL VALUES OF GAS COALS AND CANNELS, by D. A. GRAHAM. 8vo., Cloth. $3.

GAS COMPANIES DIRECTORY. $3.

GAS VERSUS ELECTRIC LIGHT. 50 cents.

THE AMERICAN GAS ENGINEER AND SUPERINTENDENT'S HANDBOOK, by WM. MOONEY. $3.

DIGEST OF GAS LAW. $5.

GAS ENGINE INDICATOR DIAGRAM, by W. E. AYRTON. Paper. 20 cents.

ILLUMINATING AND HEATING GAS, by W. BURNS. $1.50.

TESTING PIPES AND PIPE JOINTS, by M. M. PATERSON. 80 cents.

DESIGNING WROUGHT AND CAST IRON WORK, by H. ADAMS. Paper. Three parts, 60 cents each.

NOTES IN MECHANICAL ENGINEERING, by H. ADAMS. $1.

STRAINS IN IRONWORK, by H. ADAMS. With plates. $1.75.

ELECTRICITY.

THE ELEMENTS OF ELECTRIC LIGHTING, Including Electric Generation, Measurement, Storage, and Distribution, by PHILIP ATKINSON. $1.50.

ELEMENTARY ELECTRICITY, by PROF. F. JENKIN. 40 cts.

ELECTRIC TRANSMISSION OF ENERGY, by G. KNAPP. $3.

ARC AND GLOW LAMPS, by J. MAIER. Illustrated. $3.

ELECTRICIAN'S POCKET-BOOK, by MONROE and JAMIESON. $2.50.

MAGNETISM AND ELECTRICITY, by J. OVEREND. 40 cents.

ACCUMULATORS, by SIR D. SALOMONS. $1.20.

DYNAMO BUILDING, by F. W. WALKER. 80 cents.

ELECTRICAL TABLES AND FORMULÆ, by L. CLARK and R. SABINE. $5.

ELECTRIC LIGHTING FROM CENTRAL STATIONS, by G. FORBES. Paper. 40 cents.

ELECTRIC LIGHT PRECAUTIONS, by K. HEDGES. Illustrated. $1.

SUPPLY OF ELECTRICITY BY LOCAL AUTHORITIES, by K. HEDGES. Paper. 40 cents.

DOMESTIC ELECTRICITY FOR AMATEURS, by E. HOSPITALIER. $3.

The above will be forwarded by express, upon receipt of price. If sent by mail, postage must be added to above prices. We take especial pains in securing and forwarding any other Works that may be desired, upon receipt of order. All remittances should be made by check, draft, or post office money order.

A. M. CALLENDER & CO., 42 Pine Street, New York.

GAS METERS. GAS METERS. GAS METERS.

GEO. J. McGOURKEY, Pres. WM. H. McFADDEN, Vice-Pres. (Phila.). WM. N. MILSTED, Gen. Supt. & Treas. (New York). WM. H. DOWN Sec

AMERICAN METER COMPANY.

WET AND DRY GAS METERS. PRESSURE REGISTERS. METER PROVERS.
STATION METERS. PRESSURE & VACUUM REGISTERS. PORTABLE TEST METERS.
EXHAUSTER GOVERNORS. PRESSURE & VACUUM GAUGES. EXPERIMENTAL METERS.
DRY CENTRE VALVES. CRESSON GAS REGULATORS. AMMONIA TEST METERS.
GOVERNORS FOR GAS WORKS. MARSLAND WATER METERS. BAR AND JET PHOTOMETERS.

Manufactories:
512 W. 22d St., N. Y.
Arch & 22d Sts., Phila.

GAS STOVES,
SUGG'S "STANDARD" ARGAND BURNERS,
SUGG'S ILLUMINATING POWER METER,
Wet Meters, with Lizar's "Invariable Measuring" Drum.

Agencies:
177 Elm Street, Cincinnati.
244 & 246 N. Wells Street, Chicago.
810 North Second Street, St. Louis.
222 Sutter St., San Francisco.

HELME & McILHENNY,

(Established 1848.)

GAS METER MANUFACTURERS,

Nos. 1339 to 1349 Cherry Street, Philadelphia, Pa.,

WET AND DRY GAS METERS, STATION METERS, EXPERIMENTAL METERS, METER PROVERS,

Center Seals, Pressure Registers, Governors, Indicators, Photometers, and all other kinds of Apparatus for use in Gas Works.

FOULIS' PATENT STATION AND DISTRICT GOVERNORS.

REPAIRING DEPARTMENT.—We employ a special force of skilled workmen repairing meters of **all makers.**

WM. WALLACE GOODWIN, Prest. and Treas. WM. H. MERRICK, V.-Prest. S. L. JONES, Sec. S. V. MERRICK, Supt.

THE GOODWIN GAS STOVE AND METER COMPANY,

Successors to W. W. GOODWIN & CO.

1012, 1014 and 1016 Filbert St., Phila., Pa. *142 Chambers St., New York*
76 Dearborn St., Chicago, Ill.

WALDO BROS., Agents, 88 Water St., Boston.

MANUFACTURERS OF THE "SUN DIAL" GAS STOVES, FOR COOKING AND HEATING PURPOSES.

Dry and Wet GAS METERS, Station Meters (Square, Cylindrical or in Staves) Glazed Meters, King's and Sugg's Experimental Meters, Lamp Post Meters, Etc., Etc., Meter Provers (sizes 2, 5 and 10 feet), Pressure Guages of all kinds, Pressure Registers, Pressure and Vacuum Registers, Pressure Indicators (sizes 4 inch, 6 inch and 9 inch), King's Pressure and Vacuum Gauges, Dry and Wet Centre Seals, Dry and Wet Governors, Exhauster Governors, Photometers of all descriptions. Letheby's Sulphur and Ammonia Test Apparatus complete—also Testing and Chemical Apparatus of all kinds, and of the most perfect description, for all purposes relating to Gas.

GOODWIN'S IMPROVED LOWE'S JET PHOTOMETER.

Agents for Brav's Patent Gas Burners and Lanterns.

Special attention to repairs of Meters, and all apparatus connected with the business.
All work guaranteed first class in every particular, and orders filled promptly.

G. B. EDWARDS, Mang'r, New York.
S. S. STRATTON, Mangr. Chicago.

D. McDONALD & CO.,

GAS METER MANUFACTURERS.

(Established 1854.)

51 Lancaster St., Albany, N. Y. 34 & 36 West Monroe St., Chicago, Ill.

STATION METERS, EXPERIMENTAL METERS, METER PROVERS, PRESSURE & VACUUM REGISTERS, PRESSURE GAUGES, ETC.

Also STAR GAS STOVES, RANGES, and HEATING STOVES.

We use only the very best materials, and employ the most skilled labor, and by our long experience (32 years) and personal supervision of every detail, we feel justified in assuring the public that our goods will give perfect satisfaction. Every Meter emanating from our establishment will bear the State Inspecto Badge, and will be fully warranted by us. Our Annual and Calendar will be sent to Gas Companies upon application.

GAS ENGINES. GAS ENGINES. GAS ENGINES.

Gas into Electricity

BY THE

OTTO GAS ENGINES.

Gas Companies are given by the Otto Gas Engine superior means for Production of Power and Electric Light.

In Theory the Otto Gas Engine realizes 18 per cent. actual work out of number of heat units in fuel consumed, while the ordinary steam plants reach but 12 per cent. **In Practice** a comparison of cost in dollars and cents between gas and steam power stands as follows (the figures below being taken from actual experience):

50-H.P. STEAM ENGINE AND BOILER, Running a Plant of Fifty 2000-C.P. Arc Lamps 12 Hours.		50-H.P. OTTO GAS ENGINE, Running a Plant of Fifty 2000 C.P. Arc Lamps 12 Hours.	
4,500 lbs. Indiana nut and slack, at $1.30 per ton	$2 93	9,200 cu. ft. gas, at 42 cts. per M. (for cost of gas see items below)	$3 86
Engineer, one night, at $50 per month	1 67	Engineer not needed; engine is in care of Electrician or Supt.	....
Trimmer, one day, at $40 per month	1 33	Trimmer, one day, at $40 per month	1 33
Superintendent or Electrician, one day, at $50 per month	1 66	Superintendent or electrician, one day, at $50 per month	1 66
Waste, etc., one day, at $20 per year	05	Waste, etc., one day, at $20 per year	05
Water rent, one day, at $40 per year	11	Water rent dispensed with (cooling water used over and over)	....
Wheeling coal and removing ashes, at $4 per week	58	Handling of coal included in cost of gas	....
100 pairs carbons, at $18.50 per 1000	1 85	100 pairs carbons, at $18.50 per 1,000	1 85
One pint cylinder oil, at 60 cents per gallon	07	One pint cylinder oil, at 60 cents per gallon	07
One quart engine and dynamo oil, at 50 cents per gallon	13	One quart engine and dynamo oil, at 50 cents per gallon	13
Total	$10 38	Total	$8 95

Expenses of depreciation, repairs, and interest omitted, being considered the same in both cases—though depreciation and repairs are much higher with steam on account of boiler and its appurtenances. Cost of gas in the holder we estimate for most of the Middle and Western States as follows: Coal, 30 cts.; labor, 20 cts.; purification, 2 cts.; total, 52 cts. Less coke, 7 cts., and tar, 3 cts.; leaving net cost of gas 42 cts. The items of Superintendence and repairs, being paid for by the gas sold to consumers, need not be charged on extra output for gas engine consumption. Where the cost of gas is higher than here figured, coal for steam use will be found proportionally higher, and final figures of comparison show same amount of saving.

Excess in Cost of Steam over Gas Power is thus $1.43, or nearly 16 per cent.

Coal for getting up steam and banking fires is not included in above figures, and should be added, thus increasing rate of economy of gas power beyond that shown by our figures.

Where Gas Companies adopt Gas Power for Electric Plants, Water Works, Sewerage, etc., they not only choose **the most economical power for their use,** but secure to themselves the **numerous advantages of increased production,** without increase of expense, and benefit thereby their entire manufacture. They induce consumers, by their example, to abandon Steam for Gas Power, and, by establishing special rates, make

Gas Power the Leading Power of To-Day,

AND SOLVE AT ONCE THE QUESTION OF FUEL GAS.

"Otto Gas Engine Works,"

SCHLEICHER, SCHUMM & CO.,

151 Monroe St. (Kent Building), Chicago. **33d and Walnut Sts., Phila.**

NEW YORK AGENCY, 18 VESEY STREET.